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Muddy Mountains
Wilderness

Final

Wilderness Management Plan and Environmental Assessment

U.S. Department of the Interior

of Land Management
a State Office
as Field Office

National Park Service
Pacific West Region
Lake Mead National Recreation Area

April 24, 2007

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Photo on cover: Bowl of Fire

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Final
Wilderness Management Plan
and
Environmental Assessment

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Bureau of Land Management
Nevada State Office
Las Vegas Field Office

National Park Service
Pacific West Region
Lake Mead National Recreation Area

Clark County, Nevada

April, 2007

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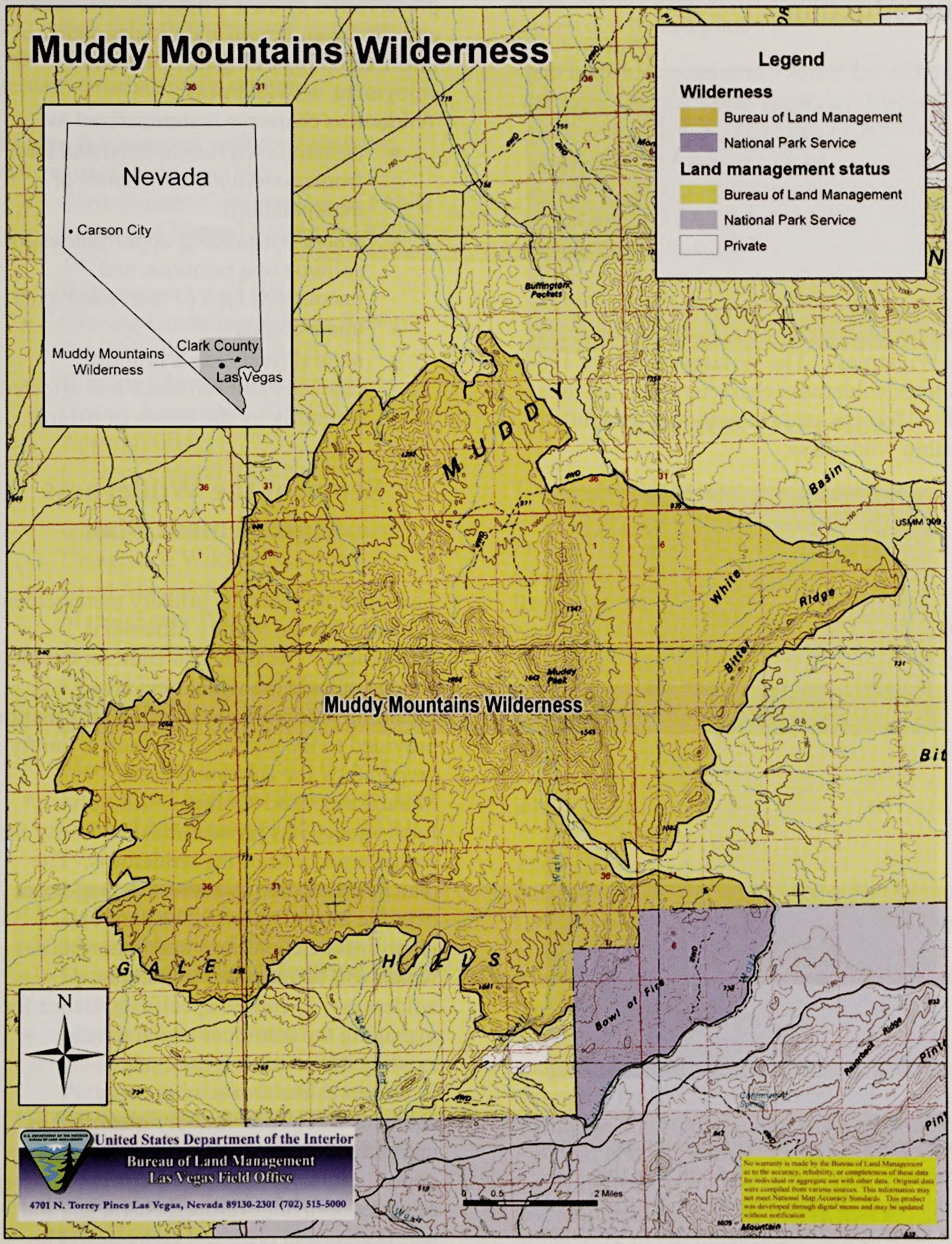

Muddy Mountains Wilderness

Nevada
Carson City
Clark County
Las Vegas
Muddy Mountains Wilderness
Legend
Wilderness
Bureau of Land Management
National Park Service
Land management status
Bureau of Land Management
National Park Service
Private
MUDDY
Buffington Pockets
Basin
White Ridge
Bitter
Muddy Peak
Muddy Mountains Wilderness
GALE HILLS
Bowl of Fire
Wash
Rainbow Ridge
Callville Wash
Pinto
USMM 309
4WD
N
0
0.5
1
2 Miles
Mountain

United States Department of the Interior
Bureau of Land Management
Las Vegas Field Office
4701 N. Torrey Pines Las Vegas, Nevada 89130-2301 (702) 515-5000

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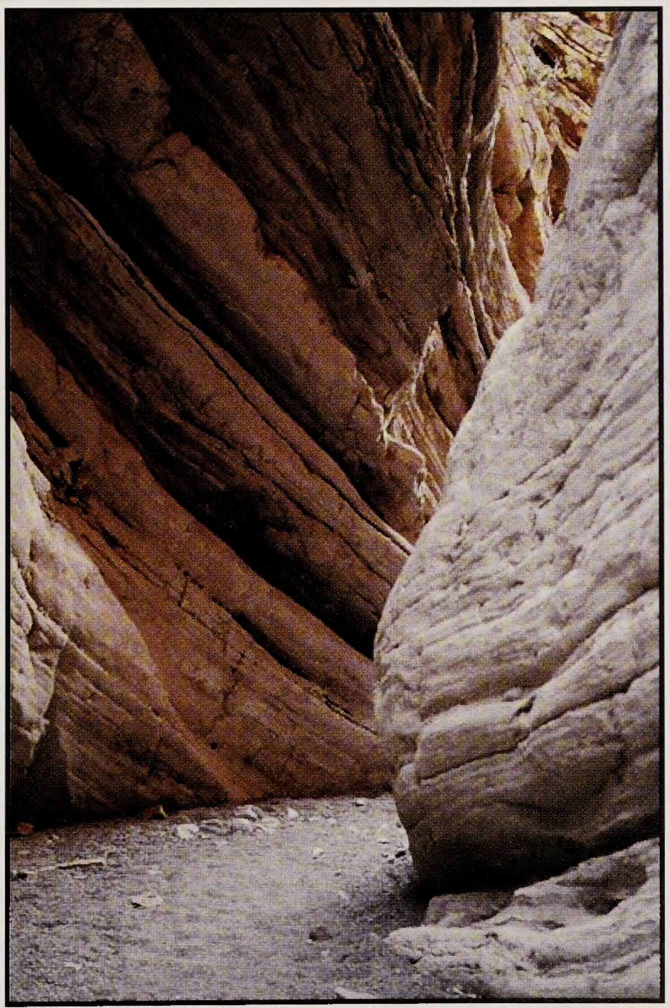
Introduction

The United States Congress established the National Wilderness Preservation System to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with Presidential approval, may designate areas as Wilderness. The Wilderness Act of 1964 defines wilderness characteristics, the uses of wilderness, and the activities prohibited within wilderness.



Anniversary Narrows

Wilderness areas provide a contrast to lands where human activities dominate the landscape. Wilderness areas are managed for the use and enjoyment of the American people in a manner that will leave them unimpaired for future use and enjoyment as wilderness, for their protection, for the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.
Wilderness character is summarized as:

- untrammeled (unhindered and free from modern human control or manipulation)
- where outstanding opportunities for solitude or a primitive and unconfined type of recreation exist
- undeveloped
- natural (retaining a primeval character and influence and affected primarily by the forces of nature)

Scope of the Wilderness Management Plan

This plan provides the primary management guidance for the Muddy Mountains Wilderness. The plan also addresses some actions outside the wilderness area, including wilderness access and information provided to the public. This plan is jointly prepared by the Bureau of Land Management and National Park Service. Each agency has jurisdictional authority for separate portions of the wilderness. The plan is anticipated to address management over the next 10 years. The plan 1) identifies the conditions and opportunities which will be managed within the wilderness; 2) creates specific guidance for managing the resources and activities existing in the wilderness; and,
3) preserves the area's wilderness characteristics cumulatively identified as untrammeled quality, outstanding opportunities for solitude or a primitive form of recreation, undeveloped character, and naturalness and primeval character. The first part of the Wilderness Plan is a comprehensive description of the wilderness situation and proposed management. The

second part is an Environmental Assessment (EA) which fully describes and analyzes the proposed management plan and three other alternative management options.

The plan is consistent with the following laws, regulation, and policy:

- Clark County Conservation of Public Lands and Natural Resources Act of 2002
- Wilderness Act of 1964
- Grazing Guidelines (House Report No. 101-405, Appendix B)
- Wildlife Management Guidelines (House Report No. 101-405, Appendix B).
- Code of Federal Regulations 43 Part 6300
- BLM Manual 8560 (Management of Designated Wilderness Areas)
- BLM Manual 8561 (Wilderness Management Plans)
- NPS Director's Order #41 (Wilderness Preservation and Management)
- BLM Las Vegas Resource Management Plan (USDOI 1998)
- Lake Mead National Recreation Area General Management Plan (USDOI 1986)
- Memorandum of Understanding Between the Bureau of Land Management and the Nevada Department of Wildlife (BLM MOU 6300-NV930-0402)
- Master Memorandum of Understanding Between National Park Service, Lake Mead National recreation Area and State of Nevada, Department of Wildlife (MU 8360-90-003)
- Clark County Multiple Species Habitat Conservation Plan (2000).

Other Environmental Assessments completed previously and covering the area of the Muddy Mountains Wilderness are superseded by this plan.

Bowl of Fire

Wilderness Overview

The Muddy Mountains Wilderness was added to the National Wilderness Preservation System by the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282 Nov. 6, 2002) and has approximately 48,019 acres. The Muddy Mountains Wilderness is managed in part by the Bureau of Land Management, Las Vegas Field Office, and National Park Service, Lake Mead National Recreation Area. There are no private inholdings in the wilderness.

The Muddy Mountains Wilderness is located approximately 20 miles northeast of Las Vegas and approximately 30 miles south of Overton in Clark County, Nevada. Elevations range from about 1,700 to 5,400 feet. The landform is a thrust fault of limestone over sandstone. Red, magenta, and tan colored Aztec sandstone are exposed through a fenster, or erosion caused "window," through the limestone at Bowl of Fire and Hidden Valley. Conglomerate rock forms light brown cliffs at the Gale Hills. Gypsum bearing soils of brown and red hues are present in the lowest elevations. The wilderness is within a desert dominated by creosote. The only trees present are desert catalpa which are found in washes. Rare plants, including Las Vegas buckwheat and Las Vegas bear poppy, occur in the gypsum soils. Animals of special interest include desert tortoise and bighorn sheep. Fire is an extremely infrequent natural occurrence in the creosote dominated desert. The presence of introduced annual grasses has the potential to increase the incidence of fire by yielding abundant fine fuel. Fires can carry through this fuel to burn native shrubs causing their long term loss. Current fire management objectives are suppression of all fires. No springs occur in the wilderness, but water may be found during the cool season at natural rainfall catchments (called tenajas) in rock formations.

The paved Northshore Road near the wilderness to the south and bladed dirt roads to the north provide relatively easy access to the wilderness. Most visitation occurs at Anniversary Narrows, Bowl of Fire, and Hidden Valley. Muddy Peak is a prominent and challenging peak, and one of the recognized peak climbing destinations of Clark County. Recreational use levels are currently moderate but regular. However, the potential for increased visitation is high considering the area's scenic attractions, proximity to Las Vegas, and the rapid growth rate of southern Nevada.

One current but undeveloped placer mining claim overlaps approximately 15 acres on the southern edge of the wilderness. There are no mineral leases. At the date of wilderness designation, no grazing was established, permitted, or authorized. The Muddy Mountain Allotment was closed in 1998 through the Las Vegas Resource Management Plan (RMP) and the White Basin Allotment was voluntarily relinquished for closure in 2000. Abandoned livestock developments within the wilderness include a small stock reservoir, and several concrete dams. No private lands are located within the wilderness. However, access to Anniversary Narrows occurs through a 215 acre private parcel located outside the wilderness.

For a more detailed description of the environment, see the Affected Environment section in the Environmental Assessment portion of this plan.

Ridge between Anniversary Narrows and Bowl of Fire

Wilderness Characteristics

The Muddy Mountains Wilderness provides outstanding opportunities for solitude except for the extreme southeastern portion of the wilderness. The southeastern area at Anniversary Narrows and the southern Bowl of Fire are the most frequently visited parts of the wilderness, and encounters with other visitors are common. That portion is frequented by direct overflights of helicopters, conducting scenic tours, which diminish the natural quiet. Nearby highway traffic is also audible. The wilderness provides outstanding recreation opportunities for hiking on and off trail, scenic viewing, hunting, and exploration. The natural character of the wilderness is generally free of human imprint except for several former vehicle trails, and five small dams. The primeval character is intact except for the occurrence of introduced plants, primarily annual grasses and tamarisk. Additional wilderness features of the Muddy Mountains Wilderness are the scenic, educational, and ecological (i.e. tinajas) values of geological formations (Aztec sandstone formations), archeological resources (rock art and evidence of past habitation), and rare plants (Las Vegas buckwheat and Las Vegas bear poppy).

Wilderness Management Goals

1) To provide for the long term protection and preservation of the area's wilderness character under a principle of nondegradation. The area's natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they will remain unimpaired.

2) To manage the wilderness for the use and enjoyment of visitors in a manner that will leave the areas unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use.

3) To manage the wilderness using the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulation as possible.

4) To manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character. Nonconforming uses are the exception rather than the rule; therefore, emphasis is placed on maintaining wilderness character.

5) To manage the BLM and NPS portions of the wilderness through a single management plan to provide a maximum amount of management consistency in wilderness protection across administrative boundaries. Where possible, management, including any regulation of visitor uses, will appear seamless to the public. Where differences in agency management occur, the plan will endeavor to utilize recognizable natural features instead of agency boundaries to demark differing management prescriptions (as allowed by law, regulation, or policy). The BLM and NPS will assist one another in wilderness management activities including education and public outreach, emergency management, law enforcement, and monitoring.

6) To manage the NPS portion of the area in a manner that furthers the purposes of the NPS Organic Act of 1916 and enabling legislation for the Lake Mead National Recreation Area. These are "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations," and "for the general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistent with applicable reservations and limitations relating to such area."

Wilderness Specific Issues

Issues to be addressed in the wilderness plan were identified through a public scoping meeting, written letters from the public, data and information provided by BLM and NPS resource staff, and input provided by other agencies. A public scoping meeting was held at the Las Vegas BLM office on April 29, 2004. Issues addressed in the plan are listed below. Most issues identified by the public also included a preference for management; the summary listed here is of the issue only. Both issues and preferences were considered in developing a range of alternatives.

1. Opportunities for solitude and primitive, unconfined recreation.

- What degree of trail management should occur? Should the agencies designate trails and or manage visitor created trails? If so, what level of maintenance, signing, and promotion of the trails should occur? Consider the potential impact from concentrating or encouraging use. This especially pertains to Hidden Valley and Bowl of Fire which are popular destinations and likely to grow in popularity.
- How should recreational uses including hiking, horseback riding, hunting, rock climbing, mountain climbing, and camping be managed?
- How should trailheads or other vehicle access points be managed? How should access roads to these points be managed? The most visited access points are at Color Rock Quarry, Anniversary Narrows, and Bowl of Fire. Should any of these accommodate equestrian access? Shooting safety is an issue at some of these locations.
- The values of natural quiet and seclusion are diminished by helicopter scenic air tour and passenger jet overflights.
- How should campfires and campfire rings be managed to avoid damage to resources and in consideration that wood is very limited?
- Should recreational use permits be required if use levels increase or if damage from camping is occurring?
- How can OHV trespass be prevented at vehicle access points?
- High use areas include Anniversary Narrows, Bowl of Fire, and Hidden Valley. What measures are necessary to manage visitor use in those areas?
- Maps and written materials, in coordination with on-site signing of recreational opportunity could be made available. How can this be done to make opportunities known and also protect the wilderness area?
- Can public access to the wilderness across private land at Anniversary Narrows be secured?
- How will commercial guiding and ranger led hikes be managed?
- Education about wilderness character and wilderness ethics should be made available to visitors

2. Protecting and enhancing the undeveloped and natural appearance of the wilderness.

- Will surface disturbances, including former vehicle routes and mining disturbance, be restored? In particular, there are vehicle routes in Hidden Valley and mining disturbance at Color Rock Quarry. Should some of those routes in Hidden Valley be kept as trails while others are rehabilitated?

- Will dams and other developments be removed?

- In areas where dispersed motorized access to the wilderness boundary is present (especially washes open to vehicles), will boundary posting occur to deter off-highway vehicle (OHV) violations?

- The Muddy Mountains have a high scenic quality value. What management actions will occur to preserve the scenic qualities?

- If paint, markings, graffiti, and similar vandalism occur, how will it be removed?

3. Preserving the naturalness and primeval character and influence of the wilderness.

- How will management address the protection of Threatened & Endangered Species, and other species of special interest or concern?

- How will cryptogamic soil crusts be preserved where recreation use is occurring? Cryptogamic soil crusts are especially prevalent and sensitive in the sandy soils of Hidden Valley and Bowl of Fire.

- Is trapping, transplanting, and relocating wildlife necessary, and if so, how would it take place?

- Under what conditions would new wildlife water sources be developed? Will existing guzzlers be evaluated and removed if found to no longer be needed? How will they be maintained if kept?

- How will the agencies manage fire?

- Will the agencies manage exotic and invasive plant species? Especially important for the Muddy Mountains is to address red brome, tamarisk, and Sahara mustard.

- Will the agencies initiate inventory, monitoring, and research of flora, fauna, and archeological resources?

- How will protection of raptor nesting sites be accomplished while recreation occurs?

- How will natural water sources be protected for wildlife where visitor use is occurring?

4. Managing supplemental values of the wilderness

Additional wilderness features of the Muddy Mountains Wilderness are the scenic, educational, and ecological (i.e. tinajas) values of geological formations (Aztec sandstone formations), archeological resources (rock art and evidence of past habitation), and rare plants (Las

Vegas buckwheat and Las Vegas bear poppy).

- How will the agencies document, monitor, and preserve archeological resources from illegal collection or recreation impacts? Special attention should be given to Hidden Valley. Should some sites be made more available for interpretation and visitor enjoyment?

- Rare plants, in particular Las Vegas buckwheat and Las Vegas bear poppy, occur in gypsum soils. How will these plants be identified and preserved?

- What management activities will be required for bighorn sheep?

- How will natural water sources be protected?

5. Managing special or other non-wilderness uses allowed by the Wilderness Act.

- Will the BLM and NPS outreach to other governmental agencies to foster compliance with wilderness goals? In particular NDOW with wildlife responsibilities, and the FAA with overflight responsibilities.

- How will feral horses and burros be managed under the Free Ranging Wild Horse and Burro Act?

6. Wilderness Management

- Will the agencies develop a monitoring program so that they can better adjust and adapt management to changing conditions?

- Will cooperative management occur between BLM and NPS in managing this wilderness?

Wilderness Management Objectives

The following objectives address management of the Muddy Mountains Wilderness area under the Wilderness Management Goals and address the identified issues. The objectives are not listed in order of priority.

a) Provide outstanding opportunities for primitive recreation with minimal supporting actions and primarily without trails. In areas of more frequent visitation, provide trails to help manage impacts.

b) Maintain existing opportunities for solitude by monitoring visitor use patterns that trigger need for management action.

c) Provide for the use and enjoyment of the wilderness in such a way that protects natural conditions through minimal regulation of visitor activities.

d) Provide for vehicle access to the wilderness while also deterring vehicles from entering the wilderness.

e) Maintain or enhance the natural appearance of the wilderness by removing unnecessary facilities and minimizing or restoring human caused surface disturbances.

f) Remove paint, markings, graffiti, or similar vandalism quickly.

g) Preserve the primeval character and influence of the wilderness through prevention, control, or eradication of non-native plants.

h) Manage for healthy, viable, and naturally distributed native wildlife and plant populations with the least amount of trammeling actions necessary.

i) To preserve the primeval character and influence of the wilderness, its native non-fire adapted ecosystem, prevent the damage caused by fire sustained through introduced annual grasses.

j) Allow for special provision land uses provided by the Wilderness Act or Clark County Act while minimizing developments, changes to naturalness, and other impacts to wilderness resources.

Current Situation and Assumptions

The current situation and assumptions of changes expected to occur during the 10 year life of the plan are considered before developing management actions for the plan objectives. Inventory, monitoring, and research will be an important aspect to meet the objectives of the plan.

1) Visitor use will continue to be regular on weekends in the fall, winter, and spring at the Bowl of Fire and Anniversary Narrows area. Use can be expected to increase in those areas and contacts between visitors will be most likely there. Regular use of the Hidden Valley area will increase but will continue to receive fewer visits than the other areas. Use in the remainder of the wilderness will be light. Recreation will require management to preserve the future use and enjoyment of the wilderness, especially in the more frequently visited locations.

- The Muddy Mountains Wilderness is within 45 minutes of Las Vegas and has good quality road access. The paved Northshore Road passes nearby the Bowl of Fire and Anniversary Narrows. The Color Rock Quarry Road is dirt but good quality access to a trail into Hidden Valley. These locations will be the most visited areas of the wilderness.

- Visitors may discover the wilderness through BLM and NPS maps and website pages, as well as newspaper, magazine articles, guidebooks published by independent sources, and word of mouth.

- Population in the Las Vegas area will continue to grow, including along the I-15 corridor to the Moapa, Logandale, and Overton area.

- Three areas are currently frequented by visitors: Bowl of Fire, Anniversary Narrows, and Hidden Valley. Use levels at these areas are expected to grow as the county population expands and additional visitors interested in non-motorized, non-mechanized recreation are drawn away from the most popular locations as they become more crowded. Although visitation levels are expected to steadily increase, use levels are not expected to surge dramatically.

- Recreational activities within the wilderness will continue to be principally hiking and hunting. Most horseback riding will continue to occur in areas surrounding the wilderness, but not inside.

- Off-highway vehicle activity will continue to occur up to the wilderness boundary only in limited areas. Off-highway vehicle use around the wilderness will continue to be limited to the presently identified routes as managed under BLM's Muddy Mountains Special Recreation Management Area and Las Vegas Valley Management and under the NPS Lake Mead National Recreation Area.

2) Preserving the natural appearance of the wilderness, including sights and sounds, will require limited management actions.

- Aircraft overflights are frequent and consist of low elevation helicopter scenic air tour flights and high elevation commercial passenger planes. Helicopter overflights affect, in order of magnitude, Bowl of Fire, Hidden Valley, and Anniversary Narrows. A proposal exists to change the route for departing flights from McCarran Airport to over the wilderness that could degrade the solitude and natural quiet of the wilderness. In addition, a proposal exists for managing scenic air tour flights that could increase or decrease the effect of helicopter overflights.

- The southern portion of the Bowl of Fire will continue to be affected by the sounds from the adjacent highway.

- A number of surface disturbances or installations exist within the wilderness area which will require some one-time work to remove or rehabilitate them.

- Visual impacts may result from increased public use of trails and washes.

3) Preserving the primeval character and influence of natural resources will require some limited management input.

- Other than a few occurrences of tamarisk, exotic noxious weeds are not known to occur in the wilderness. A number of small patches of tamarisk are known in the washes of the Bowl of Fire. Red brome, an exotic invasive weed, is widespread and complete eradication is currently not possible, although management actions to reduce surface disturbance can help prevent it from dominating the ecosystem. One dense area of red brome is known in Hidden Valley near the sandstone arch. New introductions of noxious weeds are possible and need to be addressed early to prevent widespread infestation.

- The native vegetation within the wilderness is characterized by non-fire adapted species. Although extremely infrequent, fire occurrence may accelerate in the wilderness due to the presence of introduced annual grasses which yield abundant fine fuel. Fires burning through this fuel also burn native shrubs causing their long term loss since they do not readily recover after a fire. Fires may cause localized conversion from native species dominance to dominance by non-native species.

- Artificial water developments in and around the wilderness have converted the area from cool season bighorn sheep use to year round use. The bighorn sheep herd is well established.
- Inventory, monitoring, or research projects will be periodically proposed within the wilderness. Most proposals will add to the understanding of the wilderness resource and help improve wilderness management. However, all proposals will need to be reviewed before approval to assure the work is compatible with preservation of the wilderness resource and not more suitable outside of wilderness.

4) The Muddy Mountains Herd Management Area (HMA) has been set to a herd size of zero. Until all the horses and burros are removed, they will periodically enter the White Basin and Bowl of Fire areas of the wilderness. Impact to vegetation will continue until that time, and some horse and burro trails will remain visible.

Management Strategy

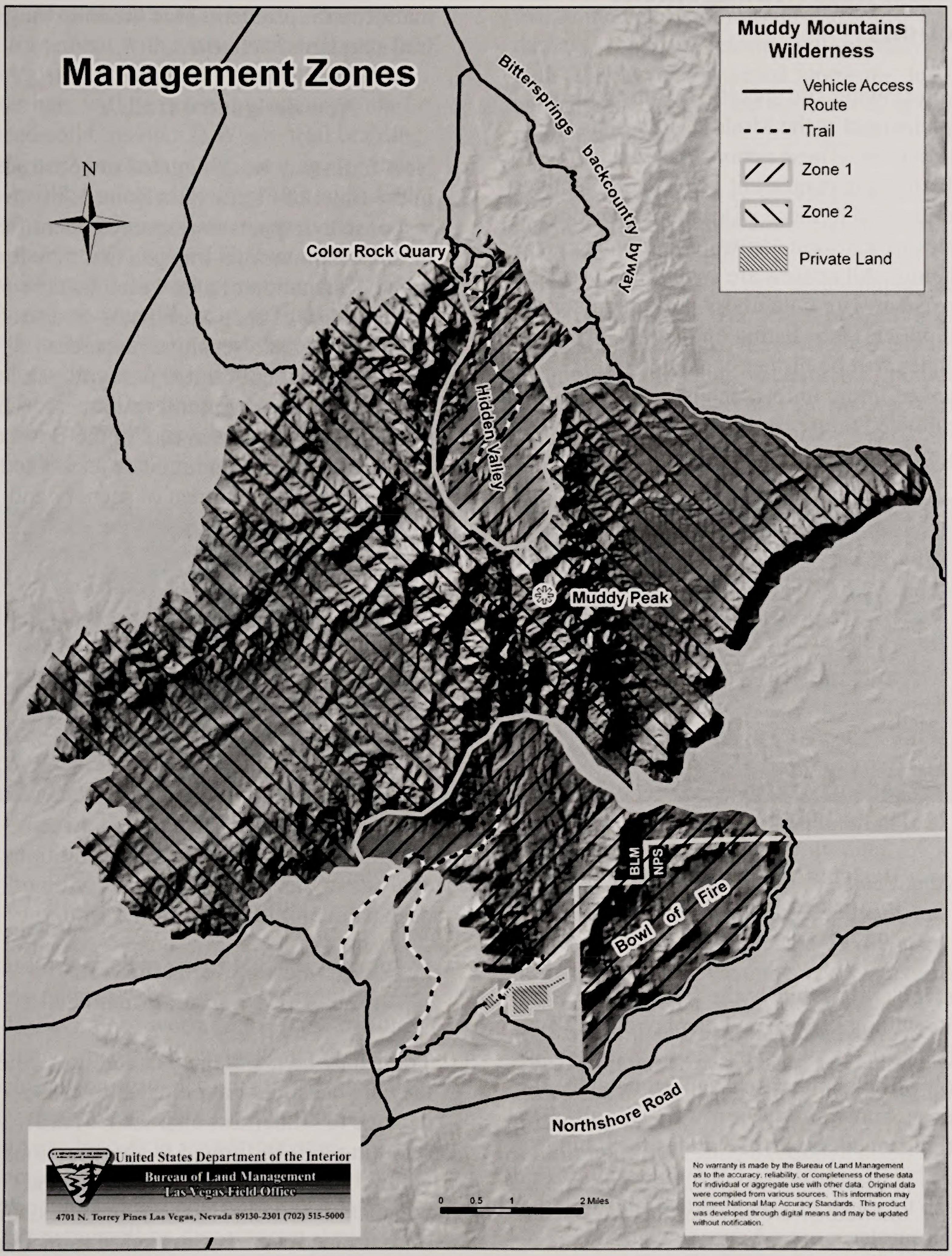
The management strategy is based on the wilderness management objectives and the current situation and assumptions. Two distinct conditions influence how the strategy is designed. First, the majority of the Muddy Mountains Wilderness is remote with difficult access. Second, some portions of the wilderness are very easily accessed and close to the growing Las Vegas Valley which will result in increasing visitation. Two management zones are described to respond to these conditions. Management actions (in the following section) correspond with the two management strategy zones.

Zone One

This zone includes Lovell Wash, the Bowl of Fire, and Hidden Valley. These areas are the most accessible portions of the wilderness. Access by designated trails and trailheads will be available. Directional signs may be provided. Horseback riding may be allowed in washes or on trails designated for horseback use. A few lightly used informal trails may be encountered. Camping will be allowed and visitors may occasionally see previously used sites, but no more than two sites within a quarter mile. Unwanted trails and campsites will be actively rehabilitated or allowed to recover naturally. Opportunity for solitude will be present, however, visitors will have the greatest possibility of encountering other visitors, especially near trailheads. Group size may be limited if monitoring identifies needs. The sights and sounds of human activity will be present. Aircraft overflights may be common, although the agencies will promote policies that reduce overflights. Highway noise in the southern portion of the Bowl of Fire is also common. Visitors will encounter risk and challenge, but route finding would be easy with the aid of designated trails, off-trail route descriptions (some agency and some privately produced), and through agency led hikes (at Bowl of Fire and Anniversary Narrows). The natural setting may be minimally modified for recreation access, but in ways that protect natural resources and have minimal visual impact. Management decisions will support healthy, viable, and naturally distributed wildlife and plant populations.

Young visitor at Bowl of Fire

Zone Two
This zone includes the majority of the wilderness and excludes Zone One. Access will be available where roads end at the wilderness boundary. A small area to park and turn around vehicles will be present. Trails will be uncommon. Foot-worn hiking paths (routes worn in by foot traffic - not agency constructed) may receive occasional management activity to protect resources. Foot-worn hiking paths will be brushy, steep, or erratic and without directional signs. Only washes will be used for horseback riding. Packed-in and certified weed-free feed would be required when feeding animals used for recreational riding or pack stock. Camping will be allowed but visitors will rarely see previously used sites. Unwanted trails and campsites may be actively rehabilitated or allowed to recover naturally. Opportunity for solitude will be outstanding and encounters with other visitors rare. The sights and sounds of human activity will be infrequent and normally only occurring from outside the wilderness or due to overflights. The agencies will promote policies that reduce overflights. Visitor's risk and challenge is greatest in this zone. Finding one's way will be moderate to difficult and will require map reading, orienteering, or climbing skills. The natural setting may be minimally modified for recreation access to protect natural resources. Management decisions will support healthy, viable, and naturally distributed wildlife and plant populations. Any necessary facilities will be located where rarely viewed by visitors.


Management Zones
N
Color Rock Quary
Bittersprings backcountry byway
Hidden Valley
Muddy Peak
BLM
NPS
Bowl of Fire
Northshore Road
Muddy Mountains Wilderness
Vehicle Access Route
Trail
Zone 1
Zone 2
Private Land
0 0.5 1 2 Miles
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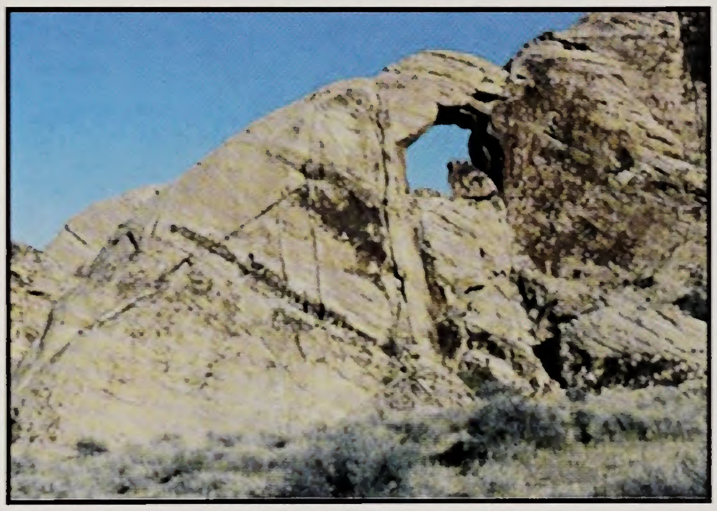
Wilderness Management Actions

The following site specific actions will be implemented at the Muddy Mountains Wilderness. These actions meet the wilderness management goals and objectives and respond to those wilderness specific issues which were identified through scoping. All actions are supplemental to and consistent with wilderness laws, regulations, and policies (see listing on page 1). These policies will be further consulted in the event of future unforeseen issues. A map of the desired future condition is located on page 27.



Hidden Valley Arch

- **Designate 7.4 miles of existing non-motorized trail, wash, and former road as hiking trail.**

Convert and designate the following existing trails within Zone 1, and display on BLM and NPS maps: 1) Arch Trail, 3.8 miles (Color Rock Quarry to a sandstone arch) for hiking; Anniversary Narrows Trail (all within Lovell Wash), 1.0 miles for hiking; and, 2) Gale Hills Trail, 2.6 miles (West End Wash to a fork of Lovell Wash) for hiking and equestrian use. Approximately 0.1 miles (0.2 acres) of new trail will be constructed to complete the Arch Trail to a terminus at a viewpoint. Some trail sections may be modified with new construction to prevent resource damage or correct maintenance problems (see the following trail standards section).

- **New designated trails.**

New trails may be designated or constructed in the Bowl of Fire, within Zone 1, in response to impacts to resources, identified through monitoring. Impacts that may lead to the designation of a trail include the development of foot-worn paths or visitor caused impacts to sensitive resources (including, but not limited to cryptogamic crusts, rare plants, cultural resources). The purpose of a designated trail in the Bowl of Fire would be to accommodate access to the area for public enjoyment of scenery and natural resources, while limiting resource impacts. A trail creating a loop connection between the washes of the south and middle access points and a trail linking that loop to the Northshore Road would be considered first. If recreational use increases and trails become evident in the upper watershed of Lovell and Calville Washes, a short connecting trail between washes may be designated to limit use to appropriate areas and provide a loop connection between washes. New trails will require additional analysis to this plan. New trails will not be designated in Zone Two of the wilderness.

- **Define standards for trail condition and maintenance.**

Trails may be maintained or rerouted where they are causing or anticipated to cause damage to wilderness character. Trail rerouting will be limited to short sections within the areas cleared by cultural and botanical inventory. No sections of existing trails are known to be in need of immediate relocation. Examples for when trail maintenance or rerouting will occur includes: 1) slopes greater than 15 percent beyond which potential for excessive soil erosion and trail deterioration is high. Very short steep sections may be retained where reinforcement with native rock will prevent soil erosion. Rolling dips or rock enforced water bars will be utilized to reduce water caused soil erosion. 2) Where trail braiding exists or is beginning, the most appropriate trail will be selected by improving its tread surface or trimming back vegetation. The alternate trail(s) will be obstructed and rehabilitated with rock or native vegetation. 3) Maintenance will strive to limit trail width to 24 inches, and not exceed 36 inches except sections along precipices (where it may be wider for safety) or sections in washes. 4) Trails may be rerouted to avoid damage to natural or cultural resources.

Hikers in a wash

- **Establish standards for managing foot-worn hiking paths.**

In addition to designated trails, foot-worn hiking paths may be present within the wilderness. Foot-worn hiking paths will not be signed, displayed on agency maps or brochures, or normally receive maintenance. They may be available for use upon discovery by hikers simply because numerous hikers are visiting the same location, but creation of new foot-worn hiking paths will be discouraged if possible. Where present, foot-worn hiking paths will normally be brushy, rough, and of erratic grades making those more challenging to traverse than a designated trail. An inventory of foot-worn hiking paths will be maintained and monitored for resource damage. Field monitoring will identify paths that have substantial footprints, lead to camping areas, have cut vegetation, or other evidence of use.

Flat bottomed sandy or gravely washes will not be defined as foot-worn hiking paths. Field monitoring will be combined with a periodic review of private sector published route descriptions. As new foot-worn hiking paths are discovered, they will be evaluated for impact to wilderness character (including cultural or biological) and the management objectives of this plan. Where possible, new foot-worn hiking paths will be rehabilitated (see guidelines for rehabilitation of disturbances later in this section). Some foot-worn hiking paths may lead to popular sites and receive regular use to the extent that rehabilitation may not be possible. These may be retained. Rock cairns will be knocked down unless needed to minimize visitor impacts to a single retrained path. Where foot-worn hiking paths are retained but the trail is found to be unstable or causing an adverse impact, the trail may be rerouted, improved, or maintained in the problem section only (and following designated trail guidelines) to make the trail compatible with protecting resources; but not to make the trail easier to travel or to attract use. An Environmental Assessment will be prepared before work on new informal trails. Examples of adverse impacts to wilderness character include excessive erosion (for example becoming a gully or a tread surface difficult to maintain a footing on), creating excessive impact (such as trail braiding or widening), or other unacceptable impact to the wilderness resource. Monitoring of foot-worn hiking paths will specifically occur at Muddy Peak, Bowl of Fire, Color Rock Quarry, between tributaries in upper Lovell Wash, all vehicle access points, and on the routes closed through this plan.

Former road in Hidden Valley

- **Designate trailheads.**

Two hiking trailheads will be designated, one at Color Rock Quarry and one at Anniversary Narrows. Trailheads will be suitable for eight vehicles. The Anniversary Narrows Trailhead will be located on an existing disturbed site on the east side and above Lovell Wash. The Color Rock Quarry trailhead will be located on the middle spur road and outside the Hidden Valley Area of Critical Environmental Concern. A post and cable barrier will define the parking area. The westernmost and easternmost spur roads at Color Rock Quarry will have signs to indicate they dead end and the center spur road will continue to have a sign indicating the Color Rock trailhead. An equestrian trailhead will be designated for the Gale Hills Trail near the intersection of NPS road 92 and Northshore Road. Highway wayside vehicle parking is available on the Northshore Road for access to the Bowl of Fire at three points: 1) at intersection of road 94 and the Northshore Road; 2) Mile post 18; and, 3) Bowl of Fire Interpretive sign. Interpretive information about the wilderness may be included at these waysides, or at the wilderness boundary as needed.

- **Manage vehicle access points.**

Other than designated trailheads, vehicles may access the wilderness at additional points where identified existing roads end at or near the boundary. This includes five access points and two boundary roads (Callville Wash and Echo Wash). No roads will be improved to facilitate wilderness access. The Color Rock Quarry Road and the Anniversary Mine Road may receive, as needed, maintenance of drainage and road prism (surface), and sight distance (for BLM, Level 3). All other access roads would receive minimum maintenance which may include obstruction removal, maintenance of drainage, and minimum maintenance of road prism (surface) (for BLM, Level 2). Vehicle access points will be defined by creating turn arounds at suitable locations at or before the wilderness boundary to help direct vehicles from continuing into the wilderness. Turn-arounds will be located at already established, sufficient size pull-outs when present within ¼ mile of the wilderness boundary. Otherwise, new turn-arounds will be created within ¼ mile of the boundary. Turnarounds will occupy approximately 0.1 acres and have adequate space for two vehicles to park parallel to the road without blocking the turn around. Vehicle barriers will be constructed where natural barriers are not adequate to keep vehicles from traveling past the turnaround. The following barrier types, listed in order of least intrusive to most intrusive, may be used: 1) wilderness sign, berm associated with the turnaround, small rocks, and or vegetation placement or restoration; 2) large boulders moved by heavy equipment; 3) post and cable; or, 4) fence or gates. The least intrusive method appropriate for the location will be used. Tread Lightly practices will be encouraged through literature and other contacts.

- **Use of signs.**

The wilderness boundary will be identified by fiberglass wilderness signs at key locations. Signs will not be located to identify the boundary between BLM and NPS lands within the wilderness. Wilderness boundary signs at trail entry points may be larger aesthetically pleasing signs with the name of the wilderness. Signboards will be placed outside the wilderness at trailheads and include wilderness and natural resources interpretive information. They may also include trailhead registers to monitor visitor use. Other access points may have smaller scaled down signboards to provide wilderness, natural resources, and regulatory information.

Within the wilderness, trail direction may be indicated by rock cairns stacked in wire frames or supported by a metal post, and no larger than two feet tall. These may be placed at trail intersections and points where the trail enters and exits a wash. Directional arrows and, at intersections, trail destination labels may be included. Trail markers are only used to keep visitors from losing their direction on designated routes; no mile markers will be provided.

- **Interpretation.**

Agency published maps accurately depicting hiking opportunities, applicable regulations, and interpretive information will be produced. Two areas within the wilderness are locally known as Hidden Valley and Anniversary Narrows, but are not officially recognized by these names from the US Board of Geographic Names. Because these two areas are regularly visited, utilizing these names in interpretive information will assist in communicating to and educating visitors about protection of the areas. Except for these two additions, only names found on the US Board of Geographic Names will be used on agency materials. Interpretive information will address wilderness character, wilderness ethics, natural resources (especially avoiding impact to cryptogamic soil crusts, Las Vegas buckwheat, Las Vegas bear poppy, and archeological resources), recreation (especially directing use to where it is most sustainable), and visitors' acceptance of risk when entering wilderness. Interpretive information may be included on kiosks, website, or brochures. No interpretive trails will be designated. An archeological site (the Happy Face Shelter) will be interpreted along the Arch Trail after the site has been mitigated (no interpretive signs or materials will be made available to the public before mitigation). Interpretation will be primarily on maps, but a small sign may be erected at the site to foster protection of the resource by explaining regulations (including closure of the site to camping) and fostering appreciation of this cultural site. Any sign would be small, minor to the setting, and set back from the site (not greater than 8 inch square and not higher than a 2 foot post).

Petroglyph at rock shelter

- **Off-site visitor information**

Basic interpretive information about the wilderness (for example, safety, wilderness character, wilderness ethics, Leave No Trace, sensitive resources, noxious weeds, and location information) will be provided in brochures, on the BLM and NPS website, on agency maps, and other educational materials as appropriate. A wilderness specific visitor map will be produced to include trails, descriptions, and interpretive information. Although not within the control of agency management, information may be made available by private sources, such as printed guide books or websites. When possible, BLM and NPS will provide information to authors in an effort to assure privately provided information is compatible with this plan. BLM and NPS will also coordinate with the US Geological Survey to remove, from future USGS map products, vehicle routes depicted within wilderness boundaries.

Directional signs to the wilderness will not be placed on roads so as not to draw in additional use from visitors who otherwise were not intending to drive to the wilderness. Open routes providing access to the wilderness boundary may be numbered on maps and on the ground.

Water pockets in a wash

- **Shooting**

NPS lands are closed to target shooting. Lands within 1/2 mile of BLM trailheads will also be closed to target shooting. Hunting, if in season and under a valid state hunting license, is permissible on BLM or NPS lands.

- **Manage camping.**

Backcountry camping will be allowed throughout the wilderness except, to minimize disruption to wildlife, within 300 feet of persistent water, within sight of trails, or within 300 feet of identified cultural resource sites. Persistent water is defined as large volumes of water including wildlife guzzlers and tinajas, but does not include bathtub or smaller sized areas of water trapped within washes which typically dry up within a week after rain. The Happy Face Shelter will be identified as closed to camping. The Las Vegas Valley closure to camping will be removed from the western portion of the area (the camping closure outside the wilderness will remain in effect). Campfires will be allowed in the wilderness except under regional fire hazard restrictions, but because of a lack of firewood, visitors will be encouraged to only use camp stoves. All fire rings will be removed when discovered. Visitors choosing to use a campfire will be required to use a fire pan. If camping increases so that more than five camp sites with a bare core area of more than 100 square feet within ¼ mile of each other are identified, a permit for overnight camping will be required for that section of the wilderness. Permits will be used to foster Leave No Trace techniques including directing visitors to appropriate existing or durable sites. Campsites closer than 300 feet to sensitive resources (for example additional cultural resource sites or areas occupied by rare plants) may be closed and rehabilitated. Occupying a camp site is not allowed for more than 14 days.

- **Maintain solitude and visitor encounter standards.**

In Zone 1, visitors will have good opportunities for solitude. Outside sights and sounds will be encountered on most trips. Encounters with other visitors will be expected on weekends on the hiking trails and frequently visited washes. Encounters with other groups (individuals traveling within sight or sound of one another) more than ½ mile from the wilderness boundary will be infrequent, with no more than eight groups encountered per day exceeded on no more than four days per year. The remainder of the wilderness will have outstanding opportunities for solitude where encounters with other groups more than ½ mile from vehicle access points will be rare, with no more than two groups encountered per day exceeded on no more than three days per year. Outside sights and sounds are rare or of short duration.

Low helicopter tour flight over the wilderness

In both Zones, noise exceeding 60 decibels (measured on the A-weighted scale) at 50 feet or which is unreasonable for the wilderness setting will be prohibited. This is not applicable to discharging a firearm while hunting, or to overflight of wilderness which is managed by the Federal Aviation Administration (FAA). The BLM and NPS may monitor the audio effect of helicopter overflights and use the data collected to advise the FAA, when appropriate, if reductions of low overflight are needed to preserve wilderness character.

Management actions that may be initiated if solitude or visitor encounter standards are exceeded will be prioritized as follows: 1) educate visitors concerning wilderness character, ethics, and manners to reduce conflict with other visitors; 2) inform visitors of non-wilderness hiking and equestrian opportunities in the region; 3) reduce the availability of or modify agency brochures or maps that may be promoting high use in excess of standards; 4) establish group size limit of 12; 5) limit parking availability; 6) a combination of the above; or, 7) initiate revision of this plan and seek public input to reassess these standards and or implement more direct controls.

- **Establish group size**.

Interpretive information will recommend limiting group size to 12. A group size limit may be established based on visitor encounter levels (see above). In addition, a group size of 12 will be established if monitoring indicates three groups over 12 individuals per month and, damage to trails or new trail development is identified. Agency (including groups that partner with the agency) led hikes will be limited to 12 people per group.

- **Adopt policies for recreational riding and pack stock animals.**

Recreational riding and pack stock animals will be limited to washes and the Gale Hills Equestrian Trail, to avoid creation of new trails and damage to vegetation and cryptogamic soil crusts that may occur as a result of cross country riding. Riding on hiking trails will not be permitted to avoid user conflicts. Cross country use of recreational riding or pack stock will not be permitted except for members of a hunting party in possession of a valid hunting license and tag, and in pursuit of big game during hunting season. Overnight camping or lengthy daytime stops will be allowed if recreational riding or pack stock animals are picketed or highlined in a wash of adequate size for the number of animals without trampling vegetation. Use of pack stock animals known to carry catastrophic disease will not be permitted so as to prevent disease transfer to bighorn sheep that would cause herd die-off. Except for incidental browsing, the grazing of recreational riding or pack stock animals will not be permitted. Feeding will be limited to packed-in and certified weed-free feed; pellets will be encouraged.

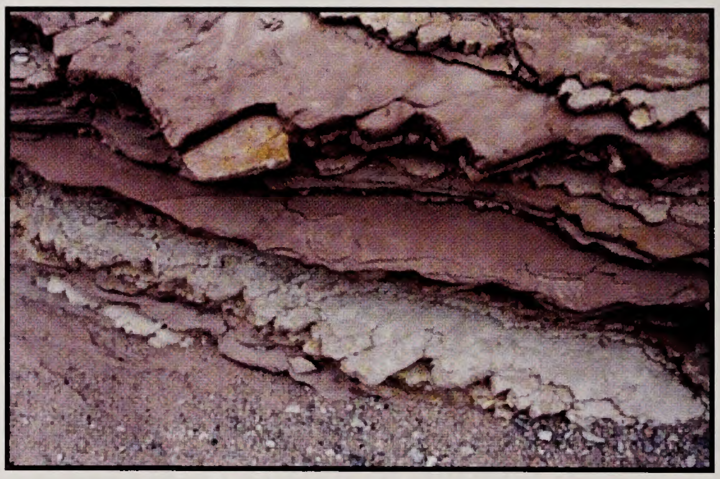
- **Establish policy for rock climbing**

Rock climbing and scrambling is allowed without the placement of fixed anchors. Fixed anchors discovered in the wilderness will be removed and the hole patched if removal would not cause undue damage to the rock. Areas within 50 feet of posted bird nesting areas (for example peregrine or prairie falcons) will be closed to climbing or scrambling during nesting periods. Use of climbing equipment (including climbing chalk) within 50 feet of rock art will be prohibited. Climbing, scrambling, or walking upon rock art surfaces will be prohibited.

- **Establish policy for guides and outfitters.**

Agency led interpretive hikes will be provided in the Bowl of Fire and Anniversary Narrows areas to interpret the area and educate visitors of the wilderness resource. Agency led hikes will primarily travel over washes, rock, and trails in order to limit impact to soils and vegetation. If use levels increase so that visitor encounter standards are exceeded, agency led hikes will be limited to no more than two per month, and will be alternated between routes. Interpretive hikes will have a group size of 12.

Commercial guiding will be permitted for: 1) big game hunting, limited to the number of big game hunting tags issued for the area by the Nevada Department of Wildlife; 2) academically oriented organizations whose primary purpose is wilderness or environmental education and a group size of 12; and 3) organizations whose service is primarily for the support of people with disabilities. Other commercial guiding services will not be permitted. Permitted guiding activities will be on an infrequent basis, no more than a total of two permitted trips per month. No limitations on number of trips will be applied to big game hunting guides other than the availability of hunting tags issued by the NDOW. Guides will be provided by the agency with information about wilderness character and wilderness ethics to provide to clients.



Rock pattern in wash

- **Rehabilitation of disturbances.**

A total of 7.5 miles of former vehicle trails in and adjacent to the Muddy Mountains Wilderness, those not designated as a trail or retained as a foot-worn hiking path, will be rehabilitated (see map). Active rehabilitation will occur at sections visible from key observation points while other sections will be left to rehabilitate naturally. Where soils are compacted, the surface may be loosened with hand tools anywhere along the rehabilitated route.

Active rehabilitation will include visually obscuring the surface disturbance by breaking up compaction, "planting" dead vegetation collected nearby the site or brought in from offsite salvage areas (only native vegetation), and by scattering rock to mimic the form and texture of the surrounding landscape. Hand tools will be used for the work. Obscuring the site will help prevent continuing human caused disturbance and will help trap native seed to foster natural recruitment. Seeding or planting live vegetation may also be utilized in those sites where there is a poor likelihood of native vegetation recruitment, or a high likelihood of infestation by a noxious weed.

The closed road which crosses into Hidden Valley from the east, and a quarry site in the Color Rock Quarry area were heavily impacted by earthmoving equipment. These sites will be actively rehabilitated with a bulldozer or excavator to break up compaction and recontour the disturbed site.

Concrete Dam

When seeding is necessary native species, with a preference for local genetic stocks, will be used exclusively. A mix of species will be selected that closely represents the plant composition for the site being reseeded. Active rehabilitation of any future disturbance that involves digging (for example fire line construction) will include recontouring to restore slopes.

- **Removal of structures and installations.**

Structures and installations will be removed if they are not historically significant, or are not the minimum necessary for administration of the area as wilderness. Once evaluated, the following may be removed:

1) Three concrete dams in Hidden Valley.
2) A concrete dam in a wash north of California Wash.
3) A fence in Hidden Valley
4) An abandoned wildlife guzzler at approximately T, 19 S, R 65 E, S 21.

Two wildlife guzzlers south of Muddy Peak will remain. An earthen dam in Hidden Valley will be left in place, but small amounts of concrete, a section of pipe, and other left over materials associated with the dam will be removed.

- **Removal of human effects.**

Wilderness Rangers will be given instruction on the identification of human artifacts 50 years old or greater. Items that are obviously less than 50 years old will be considered unattended personal property or refuse. Unattended personal property not associated with an active camp, including geocaches, will be removed by BLM or NPS personal upon being encountered and will be held at the appropriate office. If possible, the owner of the personal property will be contacted to retrieve it. In the case of a geocache, the BLM or NPS will also request the geocache sponsor to remove the site listing from the internet. The summit register on Muddy Peak will not be removed as it is a casual use that does not affect visitor use patterns. The summit register will be periodically read and recorded to document visitor use patterns. Older or filled registers may be removed and taken to the agency office for archival purposes. Human effects for which questions of age exist will be photographed for further consideration by the archaeologist.

Where paint or marks on rock from graffiti, paintballs, or other forms of vandalism occur, these marks will be removed from the surface in a timely manner. The process of removal will vary according to the types of paint or marks and the type of rock affected. For example, water soluble paints on hard rock surfaces may be removed with only water and a sponge, whereas markers used on sandstone may require more invasive procedures such as sandblasting. The least invasive methods will be used following a minimum tool analysis and the following prioritization: 1) Water with soft washing implement; 2) Water with scrubbing or scraping implement; 3) Solvent with scrubbing or scraping implement; 4) Wet or dry sand blasting equipment (where compressor is located outside wilderness and a hose can reach to the site in the wilderness); and, 5) Dry sand blasting equipment transported into the wilderness by wheeled cart or pack animal. Except for method 5, all equipment and personnel would be transported into the wilderness by foot or pack animal. If the natural patina is lost during paint removal, an oxidizing process such as *Permeon* ® would be applied to restore the patina and more closely replicate the surrounding rock. The objective would be to remove graffiti in as short a time period after its discovery, but will be timed to a week day during low use periods to avoid disruption of visitors. The site will be examined to assure that cultural resources are not present on the affected site. No solvent will be used above rock art. Removal within ten feet of rock art will require separate, site specific analysis and consultation with a Native American representative.

Paint damage to rock

- **Collection of natural resources.**

Collection of natural resources within the wilderness, including wildlife (except with a valid hunting license and tag), plants, rocks, or fossils, is prohibited at the Bowl of Fire which is defined as the area westerly of Lovell Wash and southerly of Calville Wash. These geographic features delineate all of the NPS lands and approximately 1,200 acres of adjacent BLM lands within the wilderness. In the remainder of the wilderness, collection will be allowed where consistent with existing regulations. This includes, but is not limited to the prohibition of collecting vertebrate fossils and their trace fossils (without permit), a limitation on the quantity of petrified wood that may be collected, prohibition of destructive methods of collection, and prohibition of transporting collected items through NPS lands. Collection practices will be clarified in interpretive information.

- **Research and monitoring.**

Conducting basic and specific inventory, monitoring, and research is important to wilderness management and in attaining the benefits wilderness may provide as a benchmark area. The wilderness will be available for this activity. However, when the research can be accomplished elsewhere or the research proposal would not contribute to improved management of the area as wilderness, the research will be referred to lands outside the wilderness. Researchers will be required to provide a copy of their findings to the BLM and NPS. Data will be collected in a manner consistent with section 4(c) of the Wilderness Act. The NDOW may fly over (but not land within) the wilderness for wildlife monitoring without authorization from BLM or NPS.

Population of Las Vegas buckwheat in the wilderness

- **Fire suppression.**

Fire management objectives will be to hold 90 percent of all fires to 15 acres. Firefighter and public safety will always be the first priority in fire suppression operations; protection of property is the second priority. The vegetative communities in the Muddy Mountains Wilderness are not fire adapted. The presence of non-native annual grasses increases fire intensity, rate of spread, and fire frequency. Fire further promotes dense establishment of non-native annual grasses, which increases fire susceptibility, displaces native vegetation species and diminishes the value of the habitat for native wildlife. Fires will be fought aggressively, utilizing techniques and suppression standards that entail minimal adverse impact of wilderness character. Aerial fire suppression resources including air tankers and helicopters are preferred and their use would be authorized by the incident commander. Use of existing openings for helicopter landing zones is preferred. Minimal Impact Suppression Tactics (MIST) and a policy of no motor vehicles will be used unless necessary to protect human life or property, or wilderness characteristics (including desert tortoise). To protect the ecosystem, rubber tired motorized vehicles may be used (only with Field Manager or Park Superintendent approval) to stop large escaped fires that threaten to convert native vegetation to dominance by non-native species Fire suppression guidelines are listed in Appendix C.

- **Fire prevention.**

Campfires will be prohibited in the wilderness as a part of local fire closure restrictions when fire risk is greatest. Local fire closure restriction dates vary but normally include June, July, and August.

- **Fire rehabilitation.**

Active rehabilitation work will occur in situations necessary to stabilize soil to prevent damage to downstream human life or property, or to prevent the site from becoming dominated by an exotic species. Active rehabilitation with hand tools will also occur to obscure fire lines with rock or brush, especially in those areas where they may be visible and mistaken as hiking trails. The same type of equipment used to construct fire lines will be used, as needed, for re-contouring before it is released from the fire. Otherwise, rehabilitation will be limited to natural rehabilitation (see rehabilitation guidelines earlier in this section).

- **Wildlife relocation.**

Transplants (i.e., removal or reintroduction of terrestrial wildlife species) may be permitted if necessary: (1) to perpetuate or recover a threatened or endangered species; or (2) to restore the population of indigenous species eliminated or reduced by human influence. Sites and locations outside of the wilderness will be utilized first, and if not available, transplants may be made to or from the wilderness in a manner most compatible with preserving the wilderness character of the area. Only the species whose indigenous range includes the Muddy Mountains Wilderness will be considered for relocation into the wilderness. When a species is in need of augmentation in the wilderness, and until such time as the population is thriving on its own, the BLM and NPS will consult with the Nevada Department of Wildlife in taking actions to suspend or reduce activities contributing to the condition until such time as the population is self sustainable. In furtherance of the values of this wilderness to the larger region, and when a species is sufficiently in excess of its viable population level in the wilderness, wildlife relocation from the wilderness may be approved to restore the population of the species at indigenous habitat elsewhere where long-term measures to mitigate the conditions affecting the species have been implemented. Relocation activities may be supported by motorized equipment or transport where it is the minimum necessary for the administration of the area as wilderness as determined by BLM or NPS. Staging will occur outside the wilderness boundary. Timing will consider visitor use of the area and whenever possible will be scheduled during periods when visitor use is low (for example, weekdays). In order to inform visitors of impending activity, relocation days will be posted on the BLM and NPS web sites two weeks in advance of activity.

Long-eared owl

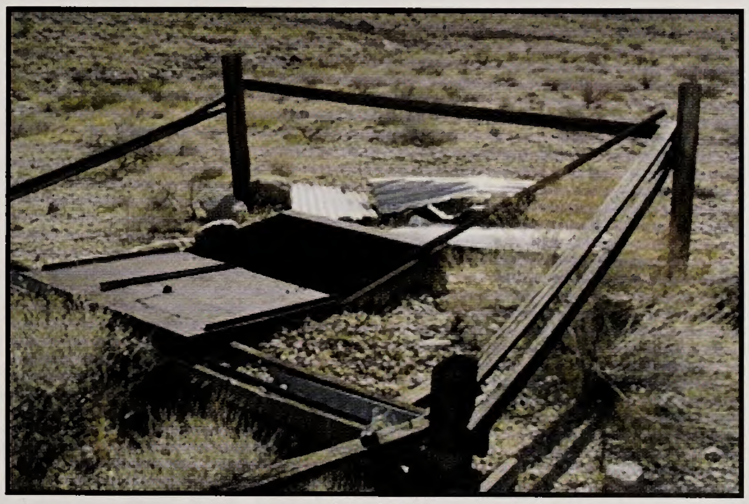
- **Wildlife water developments**.

New water developments may be permitted only when essential to preserve the wilderness resource and when necessary to maintain the local indigenous wildlife population where human activity has caused loss of water within the local population's indigenous range, and an artificial water source cannot be located outside the wilderness to achieve the same purpose. Construction may be supported by motorized equipment or transport. Wildlife water developments will not be approved on the slopes of Muddy Peak where conflicts with visitors ascending the peak may occur. Inspection and maintenance of facilities will take place by non-motorized means except for major maintenance requiring large parts or tools which cannot be transported by foot or pack stock. Water replenishment activities may occur by helicopter when a guzzler has broken or during times of prolonged drought if sustainable forage remains available. Motorized equipment requires approval by BLM or NPS.

- **Prevention and control of non-native plants.**

The management ideal is to sustain only native species in the wilderness. To achieve this, active weed management will occur to prevent, control, or eradicate weeds from the native plant communities within the wilderness. Activities that facilitate the introduction or spread of non-native species will be scrutinized to determine if the activity should be disallowed, or if special stipulations will be satisfactory to mitigate the activity. Cultural practices may be employed including avoidance of weed infested areas, seasonal closures, or weed free forage requirements. Where non-native plants are found, emphasis will be placed on controlling small infestations, weeds likely to spread and displace native plants, or plants that may disrupt ecosystem function. The Nevada noxious weed classification system will also be consulted in setting control priorities for specific weed species. Monitoring for non-native plants will occur on a regular basis (see monitoring description on page 27).

Weed treatment will focus first on reducing infestation size and ultimately seek complete eradication of weed species. Treatment activities will utilize the current knowledge of effective treatment methods and treatment strategies appropriate for the target plant and compatible with the wilderness setting. The level of treatment intensity and the minimum tool necessary will be determined prior to site specific weed treatment activities. Treatment intensity will be prioritized in the following order: Level 1) Hand grubbing with or without hand tools if plants will not resprout and where infestations are of a size manageable by small hand crews (this may occur concurrent with monitoring); Level 2) Herbicides applied by backpack or horse pack spraying equipment, in accordance with a site specific pesticide use proposal, when grubbing is not effective. This treatment intensity level may include the use of hand tools to cut plants down prior to treatment; Level 3) biological control agents approved by the Animal and Plant Health Inspection Service (APHIS) where infestations are of such size that eradication is not feasible; and, Level 4) Herbicides applied with and/or in conjunction with motorized equipment, used in accordance with a site specific Pesticide Use Proposal, where the infestation is of such size that treatment intensity levels 1 and 2 are impractical, and secondary impacts from the control activity are minor and easily rehabilitated. This treatment intensity level may include cutting plants down prior to treatment, but not include driving ground vehicles into the wilderness. Reseeding control areas with native species will be incorporated where on-site seed sources are not adequate for natural recruitment (see section for rehabilitation of disturbances).



Abandoned wildlife guzzler
planned for removal

- **Wild horse and burro management.**

Previous to this plan, the Herd Management Area that overlaps the eastern portion of the wilderness has been set to an Appropriate Management Level of zero due to the lack of sufficient water (EA # NV-052-05-399). No artificial water sources for horses or burros will be permitted within the wilderness.

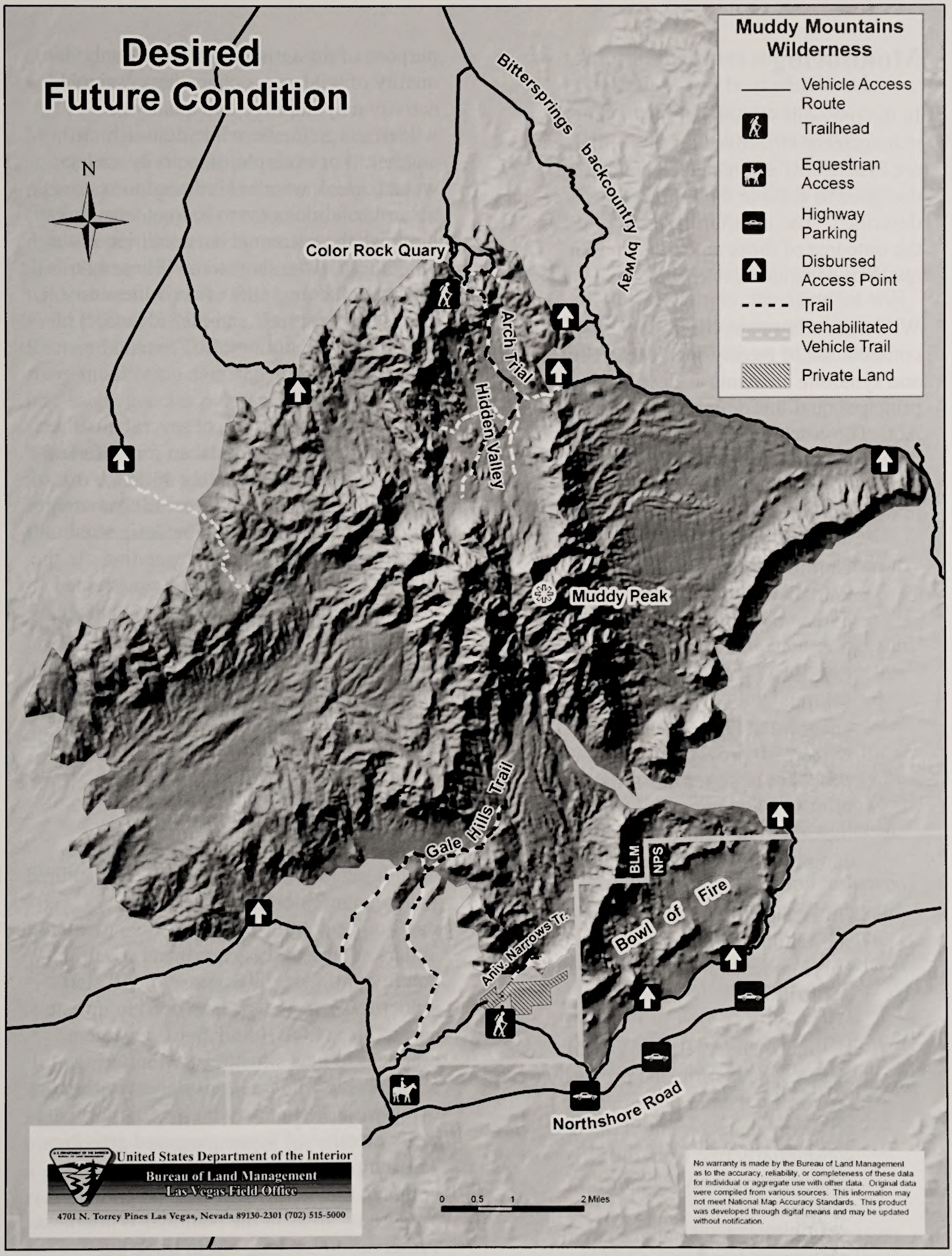
- **Livestock Grazing**

The BLM portion of the Muddy Mountains Wilderness is located within the Muddy Mountain and White Basin Grazing Allotments. These grazing allotments were closed to grazing as of the date the wilderness was designated. Because grazing was not established on the date the area became a wilderness, livestock grazing in the wilderness portion of the allotment is proscribed indefinitely. Should the non-wilderness portions of allotments be reopened at a future date, the wilderness would be segregated, as necessary, by fencing to exclude livestock.

- **Private land.**

To assure continued public access to Anniversary Narrows a parcel of private land or a public easement across those lands may be acquired if the landowner is willing to sell at the appraised value and funds are available.

Desired Future Condition


Muddy Mountains Wilderness
Vehicle Access Route
Trailhead
Equestrian Access
Highway Parking
Disbursed Access Point
Trail
Rehabilitated Vehicle Trail
Private Land
N
Bittersprings backcountry byway
Color Rock Quary
Arch Trial
Hidden Valley
Muddy Peak
Gale Hills Trail
BLM
NPS
Bowl of Fire
Aniv. Narrows Tr.
Northshore Road
0 0.5 1 2 Miles
United States Department of the Interior
Bureau of Land Management
Las Vegas Field Office
4701 N. Torrey Pines Las Vegas, Nevada 89130-2301 (702) 515-5000
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Monitoring

In the previous sections of this plan, management objectives for the wilderness are established and management actions designed to achieve those objectives are described. The monitoring section tracks the outcome of those activities on four qualities of wilderness character.

Wilderness character encompasses a combination of biophysical, experiential, and symbolic elements as described by four principal qualities defined in the Wilderness Act. The combination of these qualities distinguish wilderness from all other lands. These four qualities are of equal importance to one another and are defined as:

- Untrammeled – wilderness is unhindered and free from modern human control or manipulation.
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation – wilderness provides opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.
- Undeveloped – wilderness is substantially without permanent developments or modern human occupation.
- Natural - wilderness ecological systems, being affected primarily by the forces of nature, retain their primeval character and influence substantially free from the effects of modern human civilization.

A single activity is likely to have an effect on several qualities, even though the purpose of the activity is to affect only one quality of wilderness character. A single activity may improve one quality of wilderness character while diminishing another. For example, an activity such as weed control, which is intended to restore natural conditions over the long term, may diminish the untrammeled condition of the wilderness in the short term. These two separate outcomes, the effectiveness on improving "natural" and the side effect of diminishing "untrammeled," would be monitored separately.

Since activities may affect several qualities, separate activities undertaken for different purposes, may cumulatively diminish one of the same qualities of wilderness character. For example, a trail might be designated to control visitor impacts on vegetation. In the same vicinity, a fence may be constructed around a spring to protect it from damage by feral horses. Though the two activities are unrelated, both activities have an effect on the "undeveloped" quality of wilderness character. Monitoring the effects of single activities to multiple qualities of wilderness character will improve understanding of cumulative effects.

Effects of intentional, unintentional, and unauthorized activities would all be captured under the monitoring system. The monitoring program will provide a greater understanding of the overall and specific condition of the wilderness and will alert wilderness managers of the need to initiate corrective actions, or adapt management practices to new situations. Monitoring will also provide wilderness managers with more complete information which will improve the evaluation of future proposed activities. The monitoring would not be used to compare this wilderness with other wilderness areas in the National Wilderness Preservation System, but to track the conditions and changes within the wilderness itself.

Monitoring will occur as funding, staffing, and volunteer capabilities allow. All field reports, photographs, and monitoring data (including a copy of or reference to those data already collected by resource disciplines) will be maintained in the official wilderness files at the BLM's Las Vegas Field Office, or NPS's Lake Mead National Recreation Area Office. BLM and NPS will share monitoring data annually for inclusion into each agencies permanent file.

The following monitoring will occur to assist the BLM and NPS in tracking and improving the untrammeled condition of the wilderness:

- A log of all annual management and other activities that control or manipulate flora, fauna, soils, water, or natural disturbance factors present in the wilderness will be maintained in the permanent wilderness file. A description, location, purpose, and expected outcome of each activity will be documented. Activities that may be tracked include, but are not limited to:
    - Rehabilitation projects
    - Fire suppression activities
    - Treatments of non-native vegetation
    - Relocation of wildlife
    - Alteration of water availability.

The following monitoring will occur to assist the BLM and NPS in preserving the outstanding opportunities for solitude or a primitive and unconfined type of recreation:

- A log of the sights and sounds of civilization will be maintained in the permanent wilderness file. A description and location of the activity, whether originating from within or outside of the wilderness, will be documented.

- Because of the high frequency of aircraft overflight, the agencies will conduct acoustical monitoring to quantify the effect on wilderness character.

- A log of all regulations or restrictions on primitive and unconfined visitor use occurring in the wilderness will be maintained in the permanent wilderness file. A description of the regulation and its purpose will be included.

- Visitor use encounters on designated trails will be monitored through one or more of the following methods and recorded in the permanent wilderness file. Opportunities for visitor sign in and comment may be available at the trailheads. Public comments received at the trailhead, by mail, or by e-mail will be periodically compiled and reviewed. Automated visitor counters may be located at trailheads. In addition, assigned staff will visit trailheads at least once a month to record the number of parked vehicles and collect written comments (if any) or record trail counter data. The Wilderness Ranger will hike each trail at least twice a year to record the number of encounters and trail conditions.

- Visitor use encounters off-trail are unlikely to exceed acceptable limits and will not be as frequently monitored, however, any off-trail encounter with agency staff will be recorded, as well as any public comments or volunteer reports regarding off-trail encounters or conditions, and entries from the summit register. An important focus for monitoring off-trail use will be to identify the development of informal use trials. A review of published or internet provided information will also be used to identify areas of new popularity and then inspected in the field. Where monitoring identifies elevated use patterns, and especially if violations are detected, Law Enforcement Ranger patrols will be increased in those areas. Trail counters may also be used where elevated use patterns are detected.

- The wilderness will be monitored at boundary roads or access points once a month by Law Enforcement Rangers to detect vehicle entry violations. Low level overflight monitoring may be used to assist in detecting motor vehicle violations in progress, or to identify other activities undetected by ground monitoring.

- Trail conditions will be monitored by the assigned staff to assure standards established in this plan are maintained. Tread measurements and photos will be taken at several monitoring points at each trail and recorded electronically by a Global Positioning System (GPS). Photo and measurement monitoring will take place as needed at locations observed to be in the early stages of deterioration or high use.

- Campsites will be recorded by the assigned staff to assure compliance with plan standards. Campsites will be recorded by GPS and photos taken to track long term trends.

The following monitoring will occur to assist the BLM and NPS to track and, where possible, improve the undeveloped and natural appearance of the wilderness:

- A log of all the developments, structures, and facilities present in the wilderness will be maintained in the permanent wilderness file. A description, location, purpose, and expected outcome of the feature will be documented.

- All former vehicle trails that are converted to trail use or rehabilitated will be checked in the field at least twice a year to ensure they are not continuing to receive motorized use; and if rehabilitated, the success of rehabilitation. If unauthorized vehicle use continues, modifications as described in the plan will be made to the closure.

The following monitoring will occur to assist the BLM and NPS in preserving the naturalness and primeval character and influence of the wilderness:

- A log of all known human alterations to the ecosystem will be maintained in the permanent wilderness file. A description and location (where applicable) will be documented or referenced. Conditions that may be tracked include, but are not limited to:
    - Non-native species
    - Threatened, endangered and sensitive species

    - Species no longer present in the wilderness.
    - Air quality
    - Presence, abundance, and distribution of native species

- A log of natural (or similar human caused) disturbances will be maintained in the permanent wilderness file. A description and location will be documented or referenced. Activities that may be tracked include, but are not limited to:
    - Fire
    - Flood
    - Insect or disease outbreaks

- Monitoring for noxious weeds will occur or a regular basis so that 20 percent of the wilderness area has been surveyed for the presence of weeds every five years. Monitoring will be especially focused on trails or in washes receiving regular visitor use. Records and GPS locations will be shared between the BLM and NPS wilderness staff and Noxious Weed Coordinators.

- Monitoring for horses and burros will be incorporated into all patrols of the eastern portion of the wilderness to support their removal from the area.

- Wildlife monitoring will be conducted predominately by the Nevada Department of Wildlife according to the agency's established protocol. Agency staff from the BLM and NPS will also record wildlife sightings, especially for nesting raptors, bighorn sheep, Gila monster, desert tortoise, kit fox, bobcat, and cougar. Monitoring or research by other entities may occur according to protocol described in the plan.

- Findings, or a reference to the findings, from inventory, monitoring, and research projects completed in the wilderness will be included in the wilderness file. Other known research outside the wilderness but applicable to the understanding of the wilderness ecosystem may be referenced.

Plan evaluation

The plan will be revised when the management actions prescribed no longer meet the wilderness management objectives, or when a change in the existing situation warrants revised management. The need for revision will be reviewed every 10 years as funding and staffing capabilities are available. If the decision is made to revise the plan it will be accomplished with public participation, and through cooperation between the BLM and NPS. Minor revisions such as typographical or cartographical errors will be made by inserting an errata sheet.

Plan Implementation Sequence

Management of the Muddy Mountains Wilderness will be carried out in accordance with this plan under the direction of the Las Vegas BLM wilderness staff or Lake Mead NPS staff. Other BLM or NPS staff and volunteers may be called upon for support or subject expertise. Four types of management activities may occur: 1) ongoing activities carried out through the life of the plan; 2) activities that will be implemented as special projects at the beginning of the plan; 3) management activities triggered by changes in conditions as detected through monitoring; and, 4) activities that may be proposed in the future for which general guidance exists in the plan, or that may not be addressed in the plan. The following list shows the priority sequence for accomplishing management activities of the plan. The actual implementation could be altered based on funding and staff or volunteer availability outside the control of this plan.

Ongoing activities

- Maintenance of boundary signs
- Trailhead and vehicle access point maintenance
- Wilderness monitoring
    - Visitor use monitoring
    - Natural resource monitoring
    - Trail condition monitoring
    - All other wilderness character monitoring
- Visitor information dissemination

Special projects (in order of priority)

- Archeological, botanical, and Threatened & Endangered Species clearances to support plan implementation Archaeological sites may require additional mitigation efforts.
- Write and publish supplemental rules for all visitor use standards established in the plan.
- Rehabilitation
    - Former vehicle routes
- Vehicle access points situated
- Trail designation
    - Trail preparation (improvement of sections not currently within standards)
    - Trail marking (directional markers)
    - Trailhead development
- Signing
    - Trailhead and vehicle access point wilderness information signs
    - Off site kiosks
- Non-native plant control
- Removal of unnecessary structures and installations

Changing conditions

- Rehabilitation
    - New visitor impacts
    - Fire rehabilitation
- Trail maintenance and stabilization
- Management of social conditions
    - Visitor use requirements
    - Group size
- Fire suppression
- Non-native plant control

Potential future proposals

- Guiding permits
- Wildlife projects
- Research on natural resources
- Property acquisition

Actions that require a use prohibited in Section 4(c) of the Wilderness Act and are not fully described and analyzed in the plan, or other actions that are not adequately described and analyzed require separate Environmental Assessment and or 30 day public notification.

Environmental Assessment #NV-050-2006-349

Purpose and Need

The Muddy Mountains Wilderness was designated by Congress on November 6, 2002. BLM and NPS policy is to manage wilderness areas under the guidance of a Wilderness Management Plan. There is a need to 1) identify the conditions and opportunities which will be managed for within the wilderness; 2) manage access to and within the wilderness; and 3) mitigate potential impacts by anticipating future recreation demands, identifying interpretive opportunities, and establishing resource protection standards. The purpose of the plan is to create specific management guidance addressing resources and activities existing in the wilderness to preserve the area's wilderness characteristics. Wilderness characteristics are cumulatively identified as the untrammeled quality, outstanding opportunities for recreation or a primitive form of recreation, undeveloped character, naturalness and primeval character, and special features. The purpose is also to identify actions that will be implemented upon adoption of the plan, and those that may be implemented in the future if changes in resource conditions occur.

Location

The Muddy Mountains Wilderness is located approximately 20 miles northeast of Las Vegas and 30 miles south of Overton in Clark County, Nevada. The wilderness is located in portions of T. 18 S., R. 65 E.; T. 19 S., Rs. 64, 65 & 66 E.; and T. 20 S., Rs. 64, 65 & 66 E; MDM. See location map on next page.

Conformance with Land Use Plan

The proposed action and alternatives are consistent with the Las Vegas Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) (1998) and the Lake Mead National Recreation Area General Management Plan (GMP) and Final EIS (2000).

Relationships to Statutes, Regulations, or Other Plans

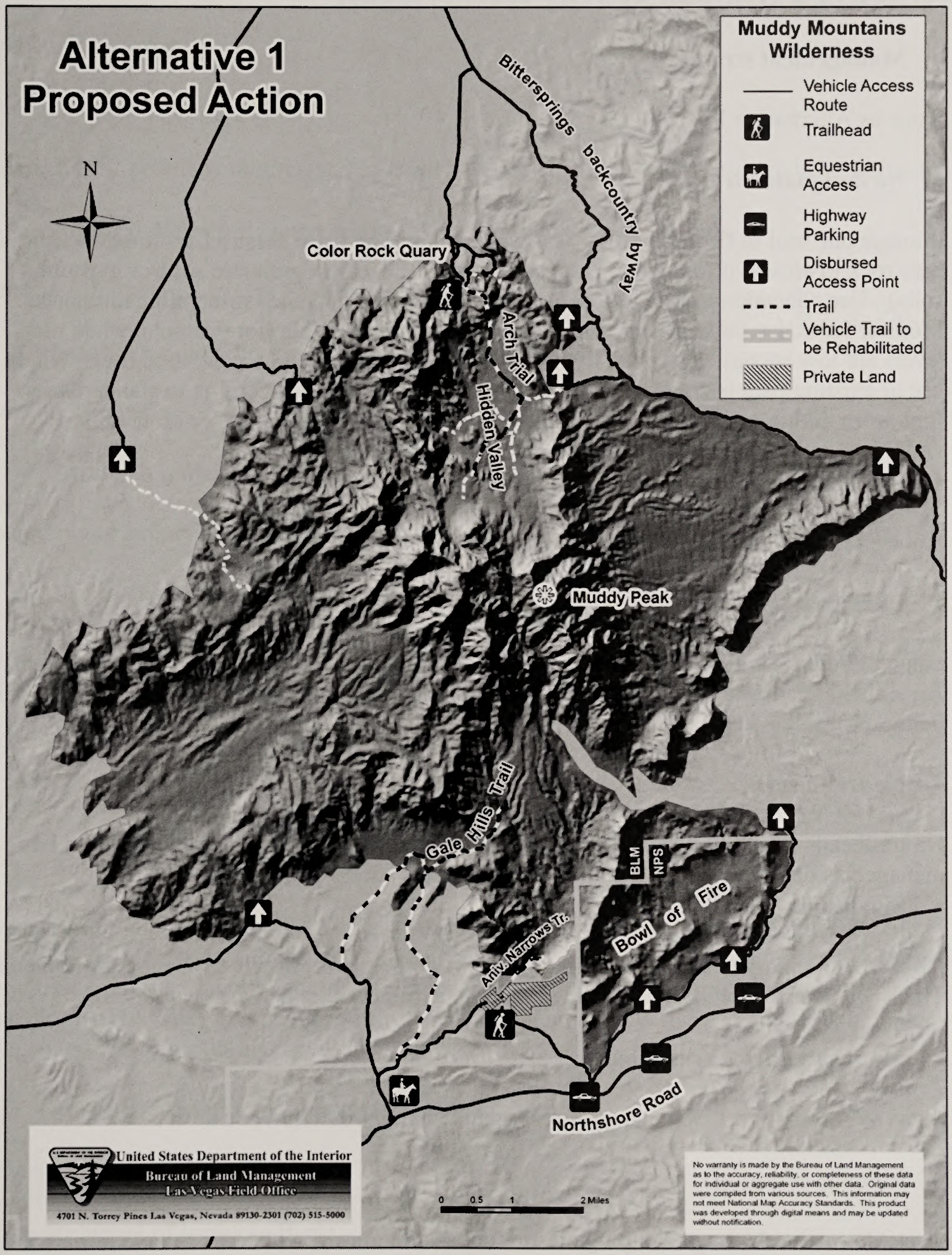
The plan conforms to the Wilderness Act of 1964 (Public Law 88-577), The Organic Act of 1916 (Public Law 16USC 1-18F, 30 Stat.535), The Lake Mead National Recreation Are enabling legislation (Public Law 88-639), The Federal Land Policy and Management Act of 1976 (Public Law 94-579), the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282), the National Environmental Policy Act of 1969 (Public Law 91-190), and Wildlife Management Guidelines (House Report No. 101-405, Appendix B).

The plan is also in conformance with 43 CFR Part 6300 – Management of Designated Wilderness Areas, and BLM Manuals 8560 - Management of Designated Wilderness Areas, and 8561 – Wilderness Management Plans. NPS Reference Manual RM41 (Wilderness Preservation and Management), Las Vegas Resource Management Plan (USDOI 1998), Lake Mead National Recreation Area General Management Plan (USDOI), Memorandum of Understanding Between the Bureau of Land Management and the Nevada Department of Wildlife (BLM MOU 6300-NV930-0402), Master Memorandum of Understanding Between National Park Service, Lake Mead National Recreation Area and State of Nevada, Department of Wildlife (MU 8360-90-003), and the Clark County Multi Species Habitat Conservation Plan (2000). Other activity level plans completed previously and covering the Muddy Mountains Wilderness are superseded by this plan.

Description of Proposed Action and Alternatives

Alternative 1 (Proposed Action)

The Wilderness Management Plan in Part I of this document would be proposed for adoption. Please refer to Part I for the description.


Alternative 1
Proposed Action
N
Muddy Mountains Wilderness
Vehicle Access Route
Trailhead
Equestrian Access
Highway Parking
Disbursed Access Point
Trail
Vehicle Trail to be Rehabilitated
Private Land
Bittersprings backcountry byway
Color Rock Quary
Arch Trial
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Muddy Peak
Gale Hills Trail
BLM
NPS
Bowl of Fire
Anniv. Narrows Tr.
Northshore Road
0
0.5
1
2 Miles
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Alternative 2 (Human activity least evident)

- **Management strategy**

Same as Alternative 1

- **No designated trails.**

Manage one trail in Hidden Valley as a foot-worn hiking path. Restrict visitors to washes or bare rock in areas with environmental sensitivities (i.e. cryptogrammic soils or gypsum soils). Use education to promote desert sensitivity and avoid sites susceptible to impacts. Monitor for active paths and rehabilitate all trails when possible (for example, when use levels are low enough that rehabilitation would not be impacted by continued use). Where use of existing path is not conducive to rehabilitation, manage according to standards for foot-worn hiking paths. These routes would not be indicated on maps or brochures.

- **Establish standards for managing foot-worn hiking paths.**

Same as Alternative 1.

- **Interpretation.**

Same as Alternative 1 except no trails or routes would be depicted on agency produced maps. An archeological site would not be interpreted. Include in interpretation why some trails are being rehabilitated.

- **No trailheads.**

No trailheads would be established, all vehicle access points to the wilderness would be managed as described under management of vehicle access points below.

- **Shooting.**

No target shooting would be permitted in the wilderness area, or within ½ mile of trailheads. The Bowl of Fire would be closed to hunting to avoid conflict between visitors.

- **Manage vehicle access points.**

Same as Alternative 1 except access road maintenance would not occur.

- **Manage camping.**

Same as Alternative 1 except camping closure in western area of wilderness would remain in effect, and no firewood collection would be allowed, all firewood must be brought in by the visitor.

- **Maintain solitude and visitor encounter standards.**

Same as Alternative 1.

- **Establish group size.**

Group of 6-12 people would require a permit. More than 12 people would not be permitted.

- **Adopt policies for recreational riding and pack stock animals.**

Same as Alternative 1 except travel would be limited to washes.

- **Establish policy for rock climbing**

Same as Alternative 1.

- **Establish policy for guides and outfitters.**

No guiding or agency led hikes permitted.

- **Use of signs.**

Same as Alternative 1 except no trail signs would be present and only small interpretive signs would be present at vehicle access points.

- **Off-site visitor information**

Same as alternative 1 except a wilderness specific visitor map would not be produced.

- **Rehabilitation of disturbances.**

Same as Alternative 1 except 10.2 miles of former vehicle trails in and adjacent to the Muddy Mountains Wilderness would be rehabilitated (see map). Some trails would be retained as foot-worn hiking paths and would not be actively rehabilitated. A quarried area in the wilderness in the Color Rock Quarry area would be reshaped with hand tools to mimic natural topography, and revegetated through natural spread of vegetation.

- **Removal of structures and installations.**

Same as Alternative 1.

- **Removal of human effects.**

Same as Alternative 1, except a summit register would not be left.

- **Collection of natural resources.**

Same as Alternative 1 except entire wilderness would be managed with the prohibition of collecting natural resources.

- **Research and monitoring.**

Same as Alternative 1, except the wilderness would not be identified as a priority area.

- **Fire suppression.**

Same as Alternative 1 except aerial retardant products would not be authorized. All air tankers would be required to use only foam or water in order to avoid dye lines from colored retardant impacting visual resources.

- **Fire prevention.**

Same as Alternative 1.

- **Fire rehabilitation.**

Same as Alternative 1.

- **Wildlife relocation.**

Same as Alternative 1.

- **Wildlife water developments.**

Same as Alternative 1 except BLM would consult NDOW regarding removal of two guzzlers to return habitat back to cool season bighorn sheep use.

- **Prevention and control of non-native plants.**

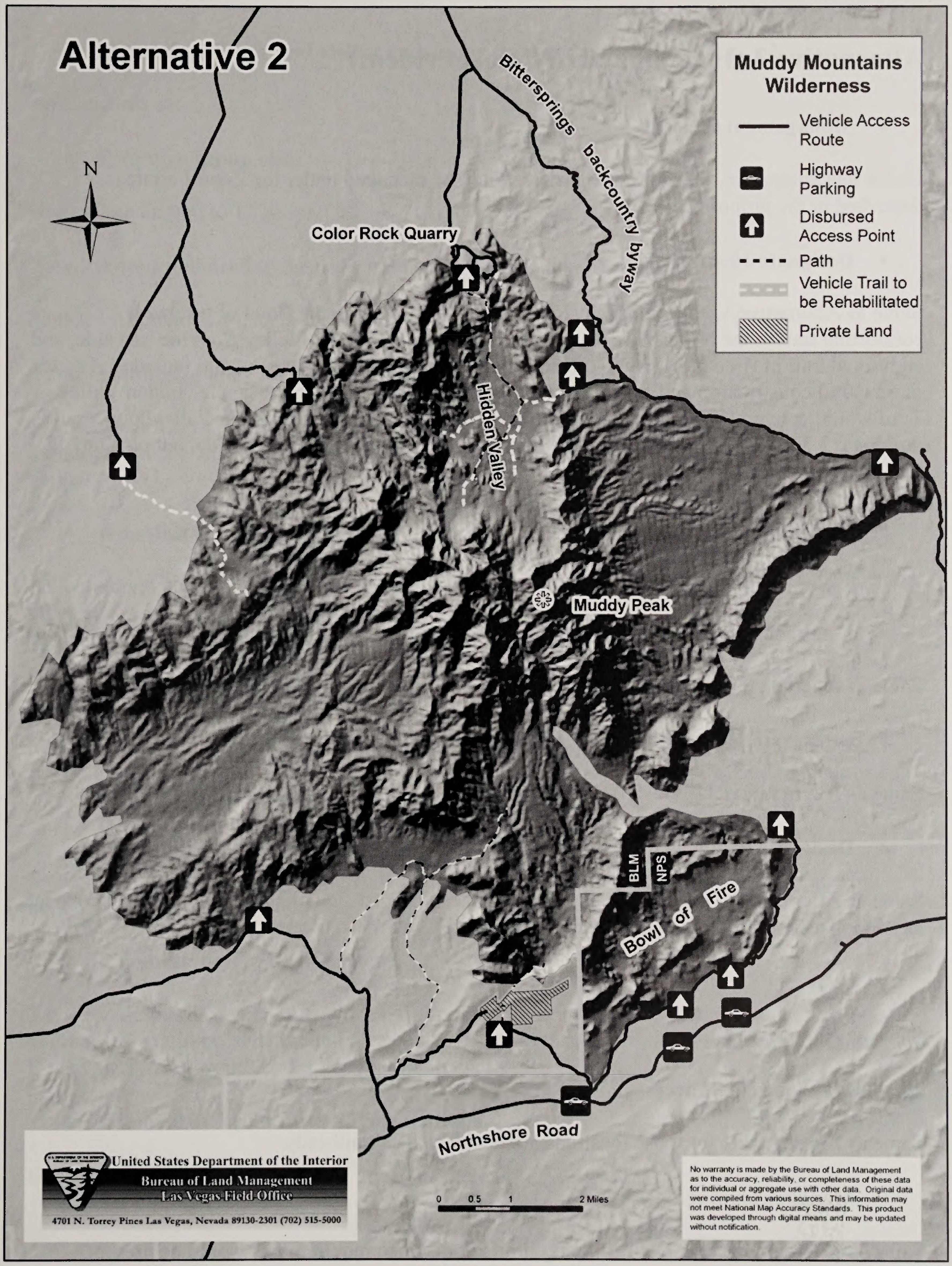
Same as Alternative 1.

- **Wild horse and burro management.**

Same as Alternative 1.

- **Private land.**

Private land at Lovell Wash outside the wilderness would not be acquired.


Alternative 2

Muddy Mountains Wilderness
Vehicle Access Route
Highway Parking
Disbursed Access Point
Path
Vehicle Trail to be Rehabilitated
Private Land
N
Color Rock Quarry
Bittersprings backcountry byway
Hidden Valley
Muddy Peak
BLM
NPS
Bowl of Fire
Northshore Road
0
0.5
1
2 Miles

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Alternative 3 (Human activity most evident)

- **Management strategy**

Under this alternative, the entire wilderness would be managed under the Zone 1 strategy described in the proposed action.

- **Designate 16.4 miles of trail.**

Same as Alternative 1, except also designate a loop trail through the Bowl of Fire with connecting trail to the Northshore Road, a second trail into Hidden Valley from the east side, and additional trail in Hidden Valley to create a loop. The Bowl of Fire trial would include 1.4 miles of new trail construction and designation of 4.5 miles of washes. The east side Hidden Valley Trail would convert 0.8 miles of closed vehicle route to trail, and the Hidden Valley loop would designate 1.3 miles of wash as trail. In addition, an access trail to the west side, but outside off the wilderness would remain open.

- **Define standards for trail condition and maintenance.**

Same as Alternative 1

- **Establish standards for managing foot-worn hiking paths.**

Same as Alternative 1

- **Interpretation.**

Same as Alternative 1.

- **Designate trailheads.**

Same as Alternative 1, except also designate trailhead on east side of Hidden Valley, and connect as a loop westernmost and central road to Color Rock Quarry to create loop.

- **Shooting**

Same as Alternative 1.

- **Manage vehicle access points.**

Same as Alternative 1 for those locations not designated as trailheads.

- **Manage camping.**

Same as Alternative 1 except no camping limits or distance requirements would be present.

- **Maintain solitude and visitor encounter standards.**

No standards set.

- **Establish group size.**

Group Size limited to 12 people.

- **Adopt policies for recreational riding and pack stock animals.**

Same as Alternative 1 except that equestrian use would be allowed on or off trail.

- **Establish policy for rock climbing**

Allow placement of fixed anchors through authorization. Initiate a process for granting authorization at a later time and after experience with a system at Red Rock NCA has been gained.

- **Establish policy for guides and outfitters.**

All commercial and non-profit guides and outfitters would be permitted in addition to agency led hikes according to the standards and limitations described in Alternative 1. Hidden Valley would also be open to guides and outfitters and agency led hikes.

- **Use of signs.**

Same as Alternative 1 except the boundary between NPS and BLM would also be demarked at intervals appropriate for visitors to know when they pass from one agency's land to another.

- **Off-site visitor information**

Same as Alternative 1 except signs indicating direction to the wilderness would be placed at major roads nearby the wilderness.

- **Rehabilitation of disturbances.**

Same as Alternative 1 except 5.2 miles of former vehicle trails in the Muddy Mountains Wilderness would be rehabilitated (see map). A quarried area in the wilderness in the Color Rock Quarry area would be left to rehabilitate on its own.

- **Removal of structures and installations.**

Dams would be left in place.

- **Removal of human effects.**

Removal of human effects would only occur after (14 days) has elapsed or attempts to notify the owner has occurred.

- **Collection of natural resources.**

Collection of natural resources is prohibited on NPS lands. Collection on BLM would be permitted according to applicable agency policy, including the northern portion of the Bowl of Fire which is within the BLM portion of the wilderness.

- **Research and monitoring.**

Same as Alternative 1.

- **Fire suppression.**

Same as Alternative 1.

- **Fire prevention.**

Same as Alternative 1.

- **Fire rehabilitation.**

Same as Alternative 1.

- **Wildlife relocation.**

Same as Alternative 1.

- **Wildlife water developments.**

Same as Alternative 1.

- **Prevention and control of non-native plants.**

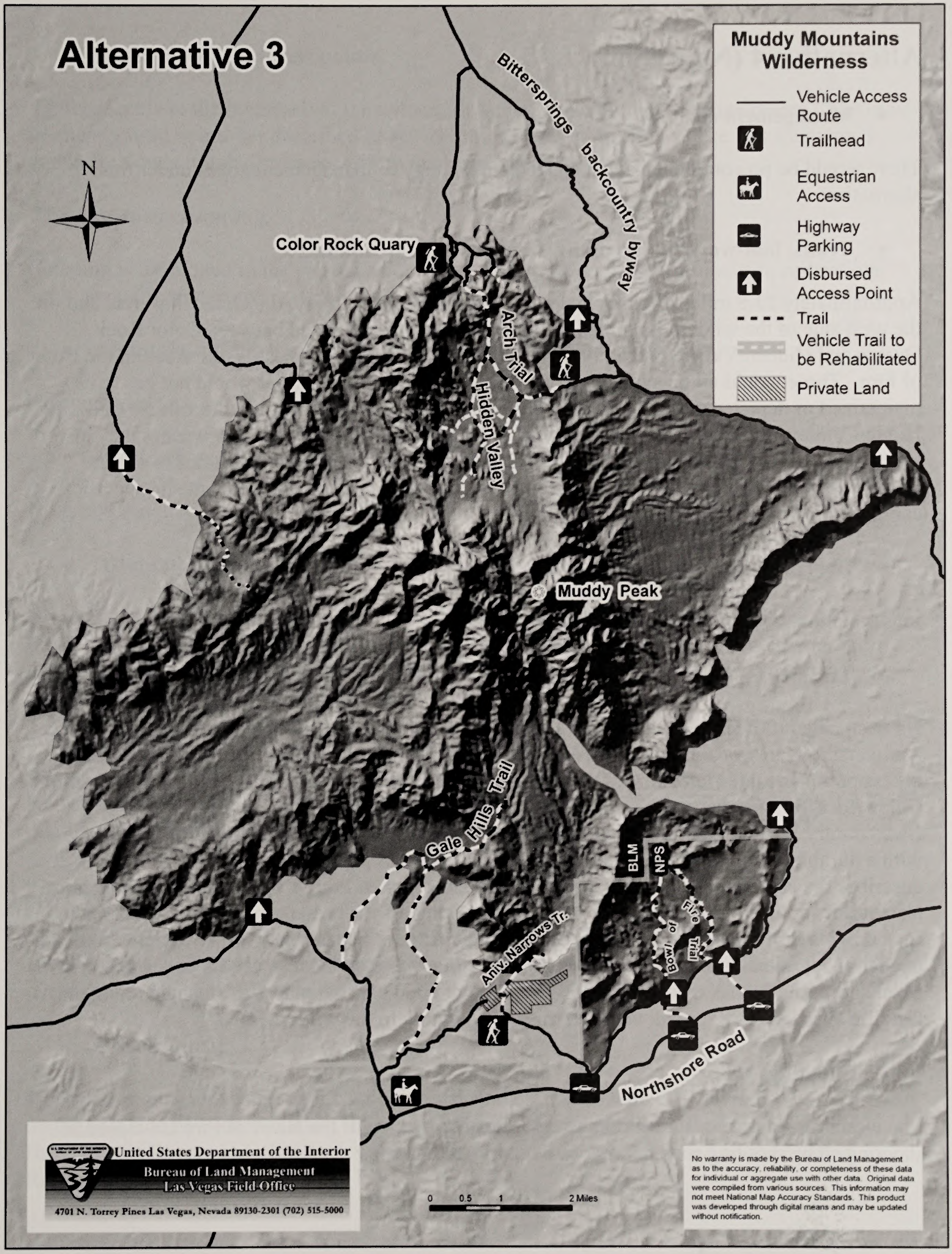
Same as Alternative 1.

- **Wild horse and burro management.**

Same as Alternative 4.

- **Private land.**

Same as Alternative 1.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Alternative 4 (No Action)

- **Management strategy**

There would be no comprehensive management strategy or management zones under this alternative.

- **Trails, foot-worn hiking paths, standards and maintenance**.

Approximately 13.8 miles of old vehicle trail exist in Hidden Valley, the Gale Hills area, and on the west side of the wilderness. In addition, one stock trail is located between Color Rock Quarry and Hidden Valley, and a hiking route (primarily within washes) is described in the Bowl of Fire. These would all be available for hiking or horseback riding, but would not be maintained or depicted on maps. Most trails are in adequate condition, but the vehicle trail into Hidden Valley from the east is especially steep and subject to erosion. Many washes may also serve as trails. No maintenance standards would be defined; if damage to resources occurs, correction of the problem would be on a case by case basis through independent site specific analysis.

- **Interpretation.**

Interpretation would be limited to agency led hikes.

- **Trailheads**.

No designated trailheads exist, though access points to Hidden Valley, Bowl of Fire, and Anniversary Narrows are regularly used and identified in commercial guidebooks. Popular access points include Color Rock Quarry, Anniversary Narrows, and Bowl of Fire. The road to Color Rock Quarry, dirt and infrequently maintained, is signed from the Bitter Springs Backcountry Byway. Another access point to Hidden Valley (on the east of the valley) is signed with a durable metal sign at the parking area. The sign was placed in the early 1980s and describes the area being closed to OHV. A dirt road accesses Lovell Wash below Anniversary Narrows from the Northshore Road. A leveled parking area is present immediately before the road drops steeply into the wash. The road into the wash is impassible to most vehicles, and once in the wash additional bedrock outcrops obstruct vehicles. Many visitors park on the Northshore Road to access the Bowl of Fire, though good parking places are located along the Calville Wash approved road, which forms the boundary to the wilderness.

- **Shooting**

The westernmost area of the wilderness and the NPS portion of the Bowl of Fire are closed to shooting. The shooting restriction does not apply to hunting.

- **Manage vehicle access points.**

Vehicle access to the boundary of the wilderness occurs at approximately nine points. The most frequently used points are described under the trailheads section above. The less frequented points are where rough dirt tracks lead to the boundary.

- **Manage camping.**

Camping is prohibited in the westernmost portion of the wilderness. Seasonal fire restrictions apply annually to the entire wilderness.

- **Maintain solitude and visitor encounter standards.**

No standards set.

- **Establish group size**.

No group size limitation established.

- **Adopt policies for recreational riding and pack stock animals.**

No restrictions to horseback riding are present. Horse trailers often park at NPS road 92. Riders travel into West End Wash and into the head of Lovell Wash. Equestrian use in other areas of the wilderness is much less frequent. The majority of horseback riding in the area takes place outside of the wilderness.

- **Establish policy for rock climbing**

No restrictions are present other than the prohibition of motorized rock drills. Six bolted sport climbing routes are currently known to be present.

- **Establish policy for guides and outfitters.**

The only commercial guiding currently operating in the wilderness is hunting guiding on the BLM portions. NPS ranger led hikes and Southern Nevada Interpretive Association led hikes occur during the cool season at the Bowl of Fire or Anniversary Narrows.

- **Use of signs.**

Fiberglass signs are present on the wilderness boundary. One metal OHV closure sign is present on the east side of Hidden Valley. Directional signs are present off the Bitter Springs Backcountry Byway to Color Rock Quarry. An interpretive sign is located on the Northshore Road at a viewpoint of the Bowl of Fire.

- **Off-site visitor information**

Very limited visitor information is provided by the agencies. Although not within the control of agency management, information is made available by private sources, such as printed guide books or websites.

- **Rehabilitation of disturbances.**

Active rehabilitation of former vehicle trails would not occur. Rehabilitation would only occur through natural means if use from hiking and horseback riding does not keep the routes in a disturbed state.

- **Removal of structures and installations.**

Five dams and a fence would remain in the wilderness.

- **Removal of human effects.**

Removal of personal property or refuse may occur after 14 days have elapsed since initial discovery. Items that are obviously less than 50 years old are not removed.

- **Collection of natural resources.**

Personal collection is permitted only on BLM lands in accordance with applicable regulations. Personal collection not permitted on NPS lands. Commercial collection is prohibited on both BLM and NPS lands. Research collection may be allowed on BLM and NPS lands by permit.

- **Research and monitoring.**

Research may occur on a case by case basis when compatible with regulations.

- **Fire suppression.**

The current fire management strategy is to suppress all fires. Fire management objectives are to hold 90 percent of all fires to 15 acres. Use of aerial fire suppression resources including helicopters, single engine air tankers and large air tankers require Field Manager or Park Superintendent approval.

- **Fire prevention.**

Local fire closure restrictions are normally in place in June, July, and August. Campfires are prohibited during this time.

- **Fire rehabilitation.**

Active rehabilitation work occurs in situations necessary to stabilize soil to prevent damage to downstream human life or property. If earth moving bulldozers or equipment are used to construct fire lines, the same type of equipment would be used as needed for recontouring before the equipment is released from the fire. Otherwise, all rehabilitation is generally limited to natural rehabilitation (see rehabilitation guidelines earlier in this section).

- **Wildlife relocation.**

Wildlife removal, reintroduction, or augmentation may be approved on a case-by-case basis and according to existing policy to restore the population of an indigenous species eliminated or reduced by human influence.

- **Wildlife water developments**

Three bighorn guzzlers were installed to convert cool season habitat to year long habitat. Though constructed for livestock grazing, not wildlife, one earthen dam and four concrete dams are also present. Two dams and one guzzler do not function. Three dams provide water during the wet season when natural water sources are also holding water, but do not reliably hold water for long after a rain; one dam may impede wildlife from reaching the water behind it.

- **Prevention and control of non-native plants.**

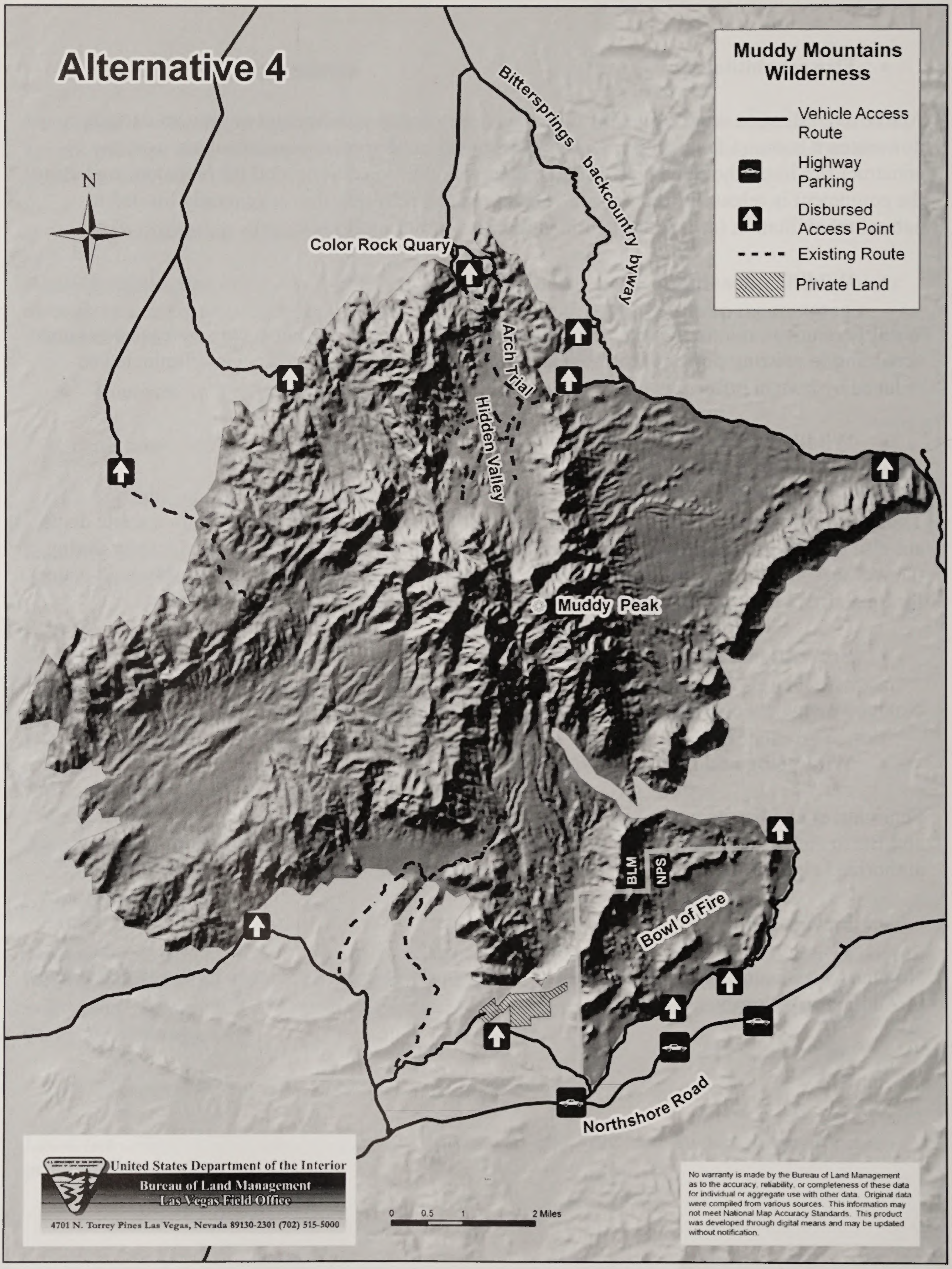
Noxious weeds are controlled on a case by case basis.

- **Wild horse and burro management.**

Feral horses and burros, managed as protected wild animals under the Free Ranging Wild Horse and Burro Act, are sometimes present in the White Basin portion of the wilderness. They are not authorized elsewhere in the wilderness. Census data shows very little use of the wilderness.

- **Private land.**

No plans have been approved for acquisition of the private property visitors must cross to access to Anniversary Narrows.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Mitigation Measures

The proposed action and alternatives were developed by the BLM and NPS staff based on all available information. Mitigation measures are incorporated into the design of the actions described in each of the alternatives. A monitoring program would be incorporated into all of the alternatives to further mitigate the potential for adverse impact to the wilderness resource. Monitoring methods are described on page 28 of the proposed Wilderness Management Plan.

To maintain compliance with the Endangered Species Act, the BLM and NPS has conducted informal Section 7 consultation with the US Fish and Wildlife Service for the proposed action to establish measures to minimize impacts to the desert tortoise. Minimization measures include pre-construction surveys and construction monitoring and avoidance of any desert tortoise observed. The complete mitigation measures specified in the consultation are incorporated into the proposed action. Implementation of the plan will include following all minimization measures as agreed upon in consultation with the Fish and Wildlife Service.

To maintain compliance with Section 106 of the National Historic Preservation Act, BLM and NPS will take into account the effects of all undertakings on historic properties. Historic properties are limited to those that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Class III inventories to identify and evaluate cultural resources will be required prior to initiating any undertaking that supports implementation of the management plan. This would include the designation of trails as well as construction activities, improvements, or the removal of existing obsolete developments. A Class III inventory of the Area of Potential Effect (APE), entailing pedestrian transects spaced no wider than 100 feet apart would be conducted. The APE is defined as the trail itself as well as any areas within view shed of the trail that have the potential to contain cultural resources, for example, rock shelters, structures, or rock surfaces suitable for rock art. If avoidance is not possible, the proposal would either 1) not be implemented, 2) a new design would be proposed in a separate Environmental Assessment, or, 3) the sites would be mitigated after consultation with Nevada State Historic Preservation Office (SHPO) and the development and approval of a treatment plan.

Affected Environment

The following resources will not be affected by the proposed action or alternatives and are not discussed in the Environmental Assessment:

- Air quality
- Environmental Justice
- Farmlands (prime or unique)
- Floodplains
- Native American Religious Concerns
- Wastes, Hazardous or Solid
- Water Quality, Drinking/Ground
- Wild and Scenic Rivers
- Migratory Birds
- Wetlands or Riparian Zones

The following resources are addressed in the Environmental Assessment as being affected by the proposed action or alternatives, or as a component to the wilderness character of the wilderness:

- Park Resources
- Areas of Critical Environmental Concern
- Cultural Resources
- Noxious Weeds
- Threatened or Endangered Species
- Wilderness
- Vegetation
- Fire
- Wildlife
- Recreation

Park Resources

Approximately 3,490 acres of the Muddy Mountains Wilderness is located within the Lake Mead National Recreation Area, a unit of the National Park system. This area is located in the southeast section of the wilderness and includes the majority of the Bowl of Fire. Park resources are not an independent resource, but rather the combination of all individual resources within an individual unit administered by the NPS. Because only a portion of the Muddy Mountains is administered by the NPS, the analysis of Park resources is identified specifically. The NPS is mandated "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations," by the NPS Organic Act of 1916. The enabling legislation for the Lake Mead National Recreation Area additionally states that this area is to be managed "for the general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistent with applicable reservations and limitations relating to such area."

Areas of Critical Environmental Concern

The Hidden Valley Area of Environmental Concern (ACEC) was designated to protect significant cultural resource values including prehistoric habitation and rock art. All but approximately 120 acres of the 3,360 acre ACEC is located within the Muddy Mountains Wilderness.

Cultural Resources

Cultural resources may be defined as the physical evidence of any past human presence that is older than 50 years. Cultural sites are the locations of former human activities that are identifiable through inventory, historical documentation, or oral history. Cultural resources include prehistoric- and historic-period sites, features, and artifacts and can range in complexity from a single stone tool or bottle fragment to a large prehistoric village or historic-period town site.

Initial efforts to identify and evaluate cultural resource properties within the wilderness demonstrated that there is high potential for the presence of eligible cultural sites within the Area of Potential Effect (APE).

In the 1980s, roughly 10 percent of the Muddy Mountains Wilderness, the majority of Hidden Valley located in the north central region, was inventoried for cultural resources. The survey was part of a stratified sampling of the Overthrust Belt (Brooks et al. 1980). As evidenced by the density of sites, Hidden Valley is an important area for cultural resources and has been designated by the BLM as an Area of Critical Environmental Concern (ACEC) to protect those resources. Within the valley, archaeologists recorded sites ranging from surface lithic scatters to several rockshelters that contained extensive midden deposits. Because of off-highway vehicle impact to the sites, BLM mitigated two of the most threatened rockshelters in 1982 and permanently closed the road into the valley.

The Archaeological Research Center (ARC) at the University of Nevada Las Vegas excavated the two rock shelter sites (26Ck1481 and 26Ck1482). Findings were non-conclusive regarding the cultural groups that utilized the shelters (Brooks et al. 1982). Ceramic types recovered include Virgin Anasazi, Lower Colorado, and Southern Paiute. Stone tools and projectile point styles date from the Archaic to the protohistoric period.

Faunal remains recovered during the excavations included bighorn sheep, rabbits, small rodents and tortoises. The importance of agave to the native diet is reflected by the number of roasting pits in the valley; however, prehistoric over-utilization of agave will result in its disappearance from an area as the plant only rarely establishes itself by seeding. Groundstone artifacts recovered during excavations point to small seed processing.

Rock art panels including petroglyphs and pictographs are scattered throughout the valley. Rock art styles vary. There are curvilinear/abstract elements as well as representational designs including quadrupeds such as bighorn sheep and anthropomorphs. Designs interpreted as atlatls (throwing sticks) and riders on horseback provide evidence that the valley was used over a long period of time.

Water is a critical component in desert environments and there is a high probability of finding prehistoric sites located near water sources. Hidden Valley and the Muddy Mountains might have been better watered in the past, but at present time only seasonal water is contained in tinajas (very small independent basins) eroded in the Aztec Sandstone bedrock and water carved pockets within bedrock exposed in washes. Prehistoric occupation of the valley was probably seasonal or brief. The large number of lithic waste flakes found scattered throughout the cultural sites in Hidden Valley would suggest tool re-sharpening in preparation for hunting.

No formal cultural resource surveys have been conducted outside of Hidden Valley and so little information is available in other parts of the wilderness. Even greater scarcity of water and food resources exists. This would preclude permanent occupation. The surveys from adjacent areas and anecdotal information indicate the potential for short term rockshelters, open campsites, hunting blinds, lithic procurement areas, rock art, and agave roasting pits.

Known historic period features within the wilderness include water retention dams and stock fencing used in ranching operations. These were probably constructed by early settlers living near Logandale and Moapa. In the 1980s, the remnants of a wagon were reported but were not mapped and could not be relocated. Color Rock Quarry, adjacent to and including the edge of the wilderness, was the site of a flagstone quarry. Longwell et al. (1965:209) report that only a small amount of material was produced from the Aztec Sandstone. In the 1920s, borax mining occurred outside of but near the present day wilderness, south of Anniversary Narrows. A report of a mining scrape from the 1940s has been reported in the Gale Hills area, but it has not been relocated. There are no known mining or prospect sites within the wilderness area.

Noxious Weeds

Opportunistic weed species tend to become established where natural or anthropomorphic disturbances are created. Disturbances create niches that weedy species quickly occupy and then out-compete native flora for resources. Once established, however, noxious weeds may spread into adjacent undisturbed areas. Tamarisk is known to occur throughout the Muddy Mountains Wilderness. Most of its occurrence is scattered individual plants along washes. A control project successfully removed the plant from the earthen dam reservoir in Hidden Valley. The majority of the tamarisk is located in the Bowl of Fire, and in places forms small dense stands. Tamarisk may come to dominate wetter areas. Red brome and Sahara mustard are non-native and invasive plants, but neither are listed as a noxious weed. Red brome is found extensively throughout the Muddy Mountains Wilderness and especially in Hidden Valley. Sahara mustard is known to occur within the nearby region, but at the present time has not been found in the wilderness. At high density, red brome or Sahara mustard may alter the natural fire regime toward increased fire intensity, greater rate of spread, and shorter fire return intervals. Because the native plant species are poorly adapted to such conditions, alteration of the fire regime favors the establishment and growth of red brome, Sahara mustard, and other non-native plant species. Ultimately the site may become dominated by these non-native plants, with little native vegetation remaining.

Threatened or Endangered Species

Federally Protected

The desert tortoise (*Gopherus agassizii*), a federally listed species, occurs within the Muddy Mountains Wilderness. The entire Mojave population was federally listed as threatened in 1990. The desert tortoise is normally found below 4,100 feet. However, they may be found at elevations up to 5,000 feet. Tortoises are most abundant in creosote-bursage communities and Mojave Desert shrub, but also occur in lower densities in the blackbrush shrub community.

Desert tortoises occupy Hidden Valley and the bajadas leading up to the steep ridges of the Muddy Mountains. Population counts within and adjacent to the wilderness indicate the area supports very low densities. There is no critical habitat for the species designated within the wilderness area.

State Protected

Several state protected species are found within the wilderness. The Las Vegas bear poppy has been identified in the wilderness in two locations, and additional populations are expected in the gypsum rich soils present in the eastern and southern portion of the wilderness.

Banded Gila monsters are known to occur in the Muddy Mountains. Gila monsters are typically found below 5,000 feet elevation and are associated with desert wash, spring and riparian habitats that integrate with complex rocky desert scrub landscapes. They spend over 95 percent of their lives underground using deep crevices and caves on rocky slopes for refuge from extreme winter and summer temperatures. Gila monsters are a federal species of concern, a state protected species, and are listed as a high-priority evaluation species in the Clark County Multi Species Habitat Conservation Plan (MSHCP).

Desert bighorn sheep have been well documented within the Muddy Mountains. Including the wilderness area and surrounding non-wilderness lands, the population is estimated to be approximately 265, with a potential population estimate of 505 based on forage supply (*Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands*). Two wildlife guzzlers were constructed within the wilderness to convert the area from cool season to year long habitat. Desert bighorns are a state protected species and considered a watch species under the Clark County MSHCP. Desert bighorn sheep are associated with rugged terrain including canyons, steep slopes, cliffs, and mountain tops. In the Muddy Mountains, desert bighorns could be described as nomadic; remaining mobile throughout their range to take advantage of variable rainfall patterns and available water sources (many of which are ephemeral). NDOW biologists have observed that desert bighorns usually limit summer activity to an area within two miles of water, although some summer movements can be greater.

Suitable roosting and/or foraging habitat for sensitive bat species, such as the spotted bat (*Euderma maculatum*), occurs throughout the Muddy Mountains Wilderness. The spotted bat is on the Watch list for the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and is considered at moderate risk by the Nevada Bat Working Group. The spotted bat is found year round in a wide variety of habitats from low elevation desert scrub to high elevation coniferous forests (Altenbach et. al, 2002) and is highly associated with rocky cliffs.

Burrowing owls may also occur and are documented to be year round residents in southern Nevada. They are a federal Species of Concern, state protected, considered a high-priority evaluation species by the Clark County MSHCP, and considered a priority species by the Nevada Partners in Flight Working Group. They are typically found in shrub/steppe or desert shrub habitats along valley floors and in association with burrowing animals such as kit fox, desert tortoise, and badgers; often using those animals burrows for nesting.

Phainopeplas (*Phainopepla nitens*) nest and forage in mesquite and cat claw acacia habitat where stands of the trees and shrubs are infested with mistletoe. No surveys for phainopeplas have been conducted within the Muddy Mountains Wilderness. Ephemeral drainages containing this vegetation may support this species.

Swainson's (*Buteo swainsoni*) and ferruginous hawks (*Buteo regalis*) may be observed hunting within the wilderness in areas vegetated with creosote-bursage scrub and Mojave desert scrub. Ferruginous hawks hunt for rodents and rabbits, while Swainson's hawks hunt small mammals and insects. Both species are state protected and the ferruginous hawk is on the Clark County MSHCP watch list.

BLM & NPS Sensitive Species

The largest population of Las Vegas buckwheat, a sensitive species under review for candidate status under the Endangered Species Act, occurs within the Muddy Mountains Wilderness. The Las Vegas bear poppy is a sensitive species which has limited occurrence in the wilderness. Both of these species occur on gypsum rich soils present in the eastern and southern portion of the wilderness.

Based on known species habitat characteristics and data collected in southern Nevada, the following sensitive bat species may occur within the Muddy Mountains Wilderness: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), western mastiff bat (Eumops perotis californicus), Allen's lappet-browed bat (*Idionycteris phyllotis*), California myotis (*Myotis californicus*), small-footed myotis (*Myotis ciliolabrum*), fringed myotis (*Myotis thysanodes*), cave myotis (*Myotis velifer*), long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*), western pipistrelle bat (*Pipistrellus hesperus*), big free-tailed bat (*Nyctinomops macrotis*), and Brazilian free-tailed bat (*Tadarida braziliensis*). Caves, rock crevices and overhangs, and abandoned mines and prospects may serve as roosts. (*Nevada Bat Conservation Plan*, 2002). There is no documentation indicating that bat surveys have been conducted within the Muddy Mountains Wilderness area.

Sensitive bird habitat is also found in the wilderness. Le Conte's thrashers (*Toxostoma lecontei*), loggerhead shrikes (*Lanius ludovicianus*), and prairie falcons are all found within the Muddy Mountains Wilderness. Peregrine falcons (*Falco peregrinus anatum*) and golden eagles (*Aquila chrysaetos*) may also be present as the rocky cliffs provide many potential nesting sites and the open valleys and bajadas provide good hunting grounds.

Chuckwallas are found throughout the deserts of the southwestern United States and northern Mexico. Habitat for this species is distributed throughout the wilderness area in creosote-bursage and Mojave mixed scrub vegetation communities where rocky outcrops and rocky hillsides are present. Their diet consists mainly of annual plants, some perennials and occasionally insects.

The wilderness is considered an Important Management Area (IMA) under the Clark County Multiple Species Habitat Conservation Plan (MSHCP). The IMAs were identified as areas that together will provide an adequate amount and quality of habitats to support viable populations of all of the species covered by the MSHCP.

Wilderness

The Wilderness Plan addresses management of the 48,019 acre Muddy Mountains Wilderness. Wilderness characteristics are described under five categories: 1) untrammeled; 2) natural and primeval character; 3) undeveloped; 4) outstanding opportunities for solitude or a primitive unconfined form of recreation, and, 5) other wilderness features. Trammeling activities that have occurred in the past include fire control and weed control. The natural and primeval character of the wilderness is mostly preserved. However, some changes in vegetation have occurred, most notably, the widespread presence of the non-native red brome. Another change from the primeval character is the presence of feral horses and burros, but their presence has been very limited. The wilderness is substantially undeveloped, however there are four concrete dams, one earthen dam, two wildlife guzzlers, a short barbed wire fence in Hidden Valley, an iron pipeline in Anniversary Narrows (the pipeline becomes exposed and buried as the gravel moves in the wash during rainstorms and can be a safety hazard when exposed), and 14.2 miles of two track vehicle route (now closed) or trail. Outstanding opportunities for solitude are present throughout the wilderness except for the southeastern area which is affected by the sights and sounds of helicopter overflights, traffic on the Northshore Road, and higher levels of visitation. Outstanding recreation opportunities for hiking, hunting, exploration, and scenery are present throughout the wilderness. Only seasonal fire restrictions and camping length of stay regulations confine recreational opportunities. Additional wilderness features of the Muddy Mountains Wilderness are the scenic, educational, and ecological (i.e. tinajas) values of geological formations (Aztec sandstone formations), archeological resources (rock art and evidence of past habitation), and rare plants (Las Vegas buckwheat and Las Vegas bear poppy).

Vegetation

The Muddy Mountains Wilderness Area is comprised mainly of a creosote bursage community which is widespread and occurs below 4,000 feet in valley bottoms and lowlands of mild slope aspect. It is principally dominated by creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Primary associated shrub species can include blackbrush (*Coleogyne ramosissima*), Mormon tea (*Ephedra* spp.), indigo bush (*Psorothamnus fremontii*), shadscale (*Atriplex confertifolia*), hopsage (*Grayia spinosa*), desert thorn (*Lycium* spp.), ratany (*Krameria erecta*), burro bush (*Hymenoclea salsola*), honey mesquite (*Prosopis glandulosa*), and brittlebush (*Encelia farinosa*). Other associated species can include Joshua tree (*Yucca brevifolia*), yucca (*Yucca* spp.), and prickly pear (*Opuntia basilaris*). However, it has been noted that the wilderness plan area does not support any Joshua trees.

The creosote / bursage community can transition into a blackbrush dominated community which occurs on upper bajadas, slopes, and valleys below 5,900 feet. This community is dominated by blackbrush (*Coleogyne ramosissima*) with the primary associated shrubs including spiny hopsage (*Grayia spinosa*), Mormon tea (*Ephedra* spp.), shadscale (*Atriplex confertifolia*), desert thorn (*Lycium* spp.), snakeweed (*Gutierrezia sarothrae*), and creosote (*Larrea tridentata*).

Washes are characterized by gravelly soils and concentration of water during rainstorms. Plant density is much greater in this community because of greater occurrence of water. Washes support the only tree species present: catalpa (*Chilopsis linearis*), mesquite (*Prosopis glandulosa*), and cat's claw acacia (*Acacia greggii*). In addition common shrubs include Brittlebush (*Encelia farinosa*), Sweetbush (*Bebbia juncea*), cheesebush (*Hymenoclea salsola*), indigo bush (*Dalea fremontii*).

While the above vegetation makes up the majority of the Muddy Mountains Wilderness, small isolated communities occur in areas of high gypsum soil content. These soils support four special status plant species.

Gypsum-bearing soils, because of their composition and structure, inhibit the establishment of surrounding vegetation. A unique community of largely gypsophile plants has evolved on these soils. The common plant associates of this community are pygmy cedar (*Peucephyllum schottii*), indigo bush (*Psorothamnus fremontii*), Mormon tea (*Ephedra* spp.), shadscale (*Atriplex confertifolia*), desert holly (*Atriplex hymenelytra*), and globe mallow (*Sphaeralcea ambigua*). There are a handful of special status plant taxa that occur on gypsum deposits in Nevada such as the Las Vegas bearpoppy (*Arctomecon californica*), the Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*), the sticky ringstem (*Anulocaulis leiosolenus*), and the Palmer's phacelia (*Phacelia palmeri*). In addition there are otherwise unique plant associates which include Sunray (*Enceliopsis argophylla* var. *grandiflora*), Parry's sandpaper bush (*Petalonyx parryi*), and the matted crinklemat (*Tiquilia latio*r).

Fire

Fire is not believed to play a substantial ecological role in the natural ecology of the desert shrub communities. The Mojave shrub ecosystem is not believed to have had occurrences of large wildfires prior to the19th century introduction of exotic annual grasses, most notably red brome. Red brome is more flammable and fire-prone than the widely spaced native grasses and shrubs because it cures out earlier and more completely and forms continuous dense fuel beds. Where infested by red brome, low desert shrublands are threatened by wildfire whenever precipitation is above average and non-native annual grasses thrive, creating fuel build-ups. The Muddy Mountains are considered a "low" fire incidence area. Only four wildland fires have been reported in the last 10 years. Typical fire suppression resources include Helicopter with crew and 1-2 wildland fire engines. Long response times and fire response delays are common given the remote nature of the Muddy Mountain area. The incidence of human-caused wildfires may increase with population growth in the county and increased public visitation. If ignitions occur during dry and windy conditions and during those infrequent years when ephemeral build-ups of invasive annuals are present, large fires could result.

Wildlife

The Muddy Mountains Wilderness supports a variety of wildlife. Its remote location, narrow canyons, and steep terrain provide crucial habitat for many solitude dependent species.

Birds and reptiles are the most commonly seen species. Prairie falcons (*Falco mexicanus*), red-tailed hawks (*Buteo jamaicenis*), turkey vultures (*Cathartes aura*), great horned owls (*Bubo virginianus*), and common ravens (*Corvus corax*) have all been documented in the area. Along the ground are burrowing owls (*Athene cunicularia hypugea*) and greater roadrunners (*Geococcyx californianus*). A large number of smaller bird species utilize this wilderness as well. Gambel's quails (*Callipepla gambelli*), a game bird, black-throated sparrows (*Amphispiza bilineata*), canyon wrens (*Catherpes mexicanus*), rock wrens (*Salpinctes obsoletus*), and horned larks (*Eremophilia alpestris*) can be found within the creosote-bursage scrub and Mojave desert scrub along the bajadas and in Hidden Valley.

Chuckwallas (*Sauromalus obesus obesus*), collared lizards (*Crotaphytus bicinctores)*, western whiptail lizards (*Cnemidophorus tigris*), side-blotched lizards (*Uta stansburiana*), gopher snakes (*Pituophis catenifer*), common kingsnakes (*Lampropeltis getulas*), sidewinders (*Crotalus cerastes*), and specked rattlesnakes (*Crotalus mitchelli*) have all been documented within the wilderness boundaries. Other species that most likely occur include long-nosed leopard lizards (*Gambelia wislizenii*), zebra-tailed lizards (*Callisaurus draconoides*), banded Gila monsters (*Heloderma suspectum cinctum*), and Mojave green rattlesnakes (*Crotalus scutulatus*).

Small mammals including desert (*Dipodomys deserti*) and Merriam (*Dipodomys merriami*) kangaroo rats, white-tailed antelope squirrels (*Ammospermophilus leucurus*), black-tailed jackrabbits (*Lepus californicus*), and desert cottontail rabbits (*Sylvilagus audubonii*) inhabit the wilderness area. A number of bat species may roost in the caves and overhangs. Desert bighorn sheep (*Ovis canadensis nelsoni*) utilize the higher elevations where the steep terrain provides protection from predators, find shelter in overhangs, and find water at ephemeral sources such as tinajas and water catchments in washes. Predators such as coyotes (*Canis latrans*) and desert kit foxes (*Vulpes macrotis*), have been sighted or have left sign of their presence. Bobcats (*Lynx rufus*) and mountain lions (*Felis concolor*) are also likely residents.

Recreation

The Muddy Mountains Wilderness is generally within an hour drive of Las Vegas. Year round visitation is possible, although hot temperatures, normally over 100 degrees, limit summer visitation. Elevations range from a low of 1,700 feet to the high point of the range at 5,431 feet. Primitive recreational opportunities are outstanding because of the size of the area, variety of topography, desert vegetation including rare plants, scenery including red sandstone, wildlife, and in most areas, solitude.

In the Muddy Mountains Wilderness, recreation opportunities include hiking, hunting, horseback riding, camping, rock scrambling, exploring, and nature study. Three areas within the wilderness are most visited. These are the Bowl of Fire, Anniversary Narrows, and Hidden Valley. Permits are not required and there are no group size limits or camping restrictions. No commercial recreation permits have been issued to operate within the wilderness except for hunting guide permits which include the wilderness as a part of a larger region permitted (see Appendix B for commercial guiding needs assessment). Water within the wilderness is scarce. Water is only available in tinajas or water catchments in washes shortly after rains. Firewood is extremely scarce. For these reasons, overnight camping within the wilderness is infrequent; most visitors are day hikers. Car camping occurs near the boundary of the wilderness at many locations, and especially at Color Rock Quarry. Car camping at the western boundary is not permitted because of a camping closure for the Las Vegas Valley. Trails are present in Hidden Valley, the eastern Gale Hills, and at California Wash (most are former motor vehicle trails). In addition, several washes in Anniversary Narrows and Bowl of Fire are described as hiking routes in guidebooks. Muddy Peak (5,387 feet) and the high point of the range offer off-trail destinations for hikers. Only a limited opportunity for rock climbing is present in the wilderness. Six short sport climbing routes (sport climbing is a bolt-intensive form of climbing which is generally not practiced in wilderness), are known to be present in the northern portion of the wilderness.

The only visitor use information currently provided by BLM or NPS for the wilderness is maps. Additional private sector information is published in guidebooks or posted on the internet. Guidebooks describe hiking routes into Anniversary Narrows and past the narrows onto Lovell Ridge, several hikes in the Bowl of Fire, routes into Hidden Valley from Color Rock Quarry and from an old road east of Hidden Valley, and routes to the top of Muddy Peak.

In the majority of the Muddy Mountains Wilderness a sense of remoteness and isolation is experienced. Numerous massive rocky outcrops, ridges, and mountainous topography combined with narrow canyons, ravines, and cracks create secluded locales and scenic vistas of land without visible human developments. The topography, the wilderness' large area, low visitation levels, and the need for route-finding skills, create outstanding opportunities for solitude. The existing noise level from aircraft over the majority of the Muddy Mountains is characterized by long periods of natural quiet periodically interrupted by high altitude commercial passenger plane overflights or low level helicopter air tour flights. In the southeastern part of the wilderness, including Anniversary Narrows and the southern Bowl of Fire, opportunities for solitude are not outstanding because of the sounds and sights of nearby highway vehicle traffic, and frequent low level scenic tour helicopter overflights. Although the Federal Aviation Administration recommends a minimum flight elevation of 2,000 feet above the ground when flying over a wilderness area, air tour pilots routinely fly over the Muddy Mountains Wilderness at about 500 feet or lower.

The Muddy Mountains Wilderness makes up approximately 20 percent of NDOW hunting unit 268. The wilderness supports a large and thriving population of bighorn sheep. Hunting occurs from the second Saturday in November to the second Sunday in December. The Nevada Department of Wildlife (NDOW) issued 14 tags for the area including and surrounding the Muddy Mountains Wilderness in 2005. Hunting tags for the unit including the wilderness are highly sought after.

The majority of the wilderness area is within the Muddy Mountains Special Recreation Management Area (SRMA), a BLM designation under the Las Vegas RMP. The Muddy Mountains SRMA is approximately 123,400 acres and includes areas surrounding the wilderness but does not include the western or southeastern portions of the wilderness. The management direction for Muddy Mountains SRMA states: *manage the majority of the area (78,480 acres) for semi-primitive non-motorized recreation opportunities, and; manage the remaining area (44,897 acres) for semi-primitive motorized recreation opportunities.* The semi-primitive non-motorized area includes the areas adjacent to the wilderness at West End Wash, Bitter Spring Valley, and north of California Wash. The semi-primitive motorized area includes the areas adjacent to the wilderness at Lovell Wash, Color Rock Quarry, and upper Echo Wash.

The southeastern portion of the wilderness is within the Lake Mead National Recreation Area (NRA), a unit of the NPS. The management direction for Lake Mead NRA is *for the general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistent with applicable reservations and limitations relating to such area.* Vehicles are limited to designated routes within the Lake Mead NRA lands.

The wilderness is accessed at nine points by roads open to limited vehicle use. The Bitter Springs Back Country Byway (BCB), a component of the National Scenic Byway system, provides access to the northern end of the wilderness. The Bitter Springs BCB is primarily high clearance and may require four wheel drive in sections. The Northshore Road, a paved highway, provides access at the southern end of the wilderness. Several high clearance or four wheel drive dirt roads branch off these two primary access roads. Those receiving the majority of use include the Calville Wash Road (providing three key access points into the Bowl of Fire), the road to Lovell Wash (providing access to Anniversary Narrows form where it ends at a point next to and above Lovell Wash), and the road to Color Rock Quarry (providing trail access to Hidden Valley). Hidden Valley is also regularly visited from an access point east of the valley by visitors who drive high clearance vehicles to that point. The Bowl of Fire is also regularly visited from several points along the Northshore Road where visitors may park on pavement and walk an additional mile over non-wilderness lands. It may be possible for off-highway vehicles (OHV) to drive dry washes to access the southwestern portions of the wilderness (this area is managed as roaded natural under the Las Vegas RMP). In other areas, vehicle access is possible to the wilderness boundary up washes, but not allowed under the Las Vegas RMP's semi-primitive non-motorized designation. All of the described access locations are also places where illegal vehicle intrusions into the wilderness take place.

Recreation activities occurring around the vicinity of the Muddy Mountains include OHV driving, and helicopter touring. OHV play around the wilderness is uncommon. BLM annually permits two or three OHV races approximately two miles west of the wilderness. OHV racing can have an impact on sight, sound, and air quality in the area, however, the distance of the race course from the wilderness is sufficient so that visitors would only hear or see the activity from limited areas on the extreme northwestern edge.

Environmental Impacts

Park Resources

In addition to determining the environmental consequences of the alternatives, NPS Management Policies (2001) requires the analysis of potential effects to determine if actions would impair park resources. Under the NPS Organic Act and the General Authorities Act, as amended, the NPS may not allow the impairment of park resources and values except as authorized specifically by Congress. The NPS must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment to the affected resources and values (Management Policies 1.4.3).

Park resources are the combination of all biological, physical, and experiential elements of the Park land. Impairment to Park resources is analyzed within this document by each individual resource of the Environmental Impacts section. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is necessary to fulfill specific purposes identified in the enabling legislation or proclamation of the park; is the key to the cultural or natural integrity of the park or to opportunities for enjoyment of the park; or is identified as a goal in the park's general management plan or other relevant NPS planning document. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot be reasonably further mitigated, of an action necessary to preserve or restore the integrity of park resources or values. Definitions of impact severity are found in Appendix A.

Areas of Critical Environmental Concern

Proposed action

The proposal would have a negligible impact to this element. The Hidden Valley ACEC was designated to protect the values of prehistoric habitation and rock art. The impacts to those values are analyzed under the proposed action analysis of the Cultural Resources section below.

Alternative 2

The proposal would have a negligible impact to this element. The Hidden Valley ACEC was designated to protect the values of prehistoric habitation and rock art. The impacts to those values are analyzed under the Alternative 2 analysis of the Cultural Resources section below.

Alternative 3

The proposal would have a negligible impact to this element. The Hidden Valley ACEC was designated to protect the values of prehistoric habitation and rock art. The impacts to those values are analyzed under the Alternative 3 analysis of the Cultural Resources section below.

No action

The proposal would have a negligible impact to this element. The Hidden Valley ACEC was designated to protect the values of prehistoric habitation and rock art. The impacts to those values are analyzed under the No action analysis of the Cultural Resources section below.

Cultural Resources

Common to all Alternatives

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties; those listed in or eligible for listing in the National Register of Historic Places (NRHP). Initial evaluation of cultural resource properties within the wilderness identify a high potential for the presence of eligible cultural sites within the Area of Potential Effect (APE). Required Class III inventories that would occur as a part of this plan would identify and evaluate cultural resources prior to initiating any undertaking that supports implementation of the management plan.

Proposed Action

Designation of trails, including interpretation of the indicated cultural site, would be mitigated as specified in an approved treatment plan in consultation with Nevada SHPO. Any construction activities, improvements, or the removal of existing obsolete developments that support implementation of this management plan would be evaluated for cultural resources prior to the initiation of the undertaking. This would include cultural resource inventories of the APE specific to each undertaking as well as the possibility of mitigating sensitive or threatened sites. Specifically, the designation of the Arch Trail, which passes by sensitive cultural sites, would require mitigation.

Potential impacts to sites in the wilderness include direct and indirect damage from pedestrian traffic, vandalism, removal of artifacts, and unauthorized excavations. Site stewardship efforts and increased patrol by law enforcement rangers and other BLM and NPS staff would help reduce impacts to cultural sites. The Proposed Action calls for periodic monitoring of visitor use and mitigation efforts if impacts to cultural resources are detected. There would be no impairment to cultural resources under this alternative.

Alternative 2

Any construction activities, improvements, or the removal of existing obsolete developments that support implementation of Alternative 2 would also be evaluated for cultural resources prior to the initiation of any undertaking. This would include cultural resource inventories of the APE specific to each undertaking as well as the possibility of mitigating sensitive or threatened sites. The trail in Hidden Valley passes by sensitive cultural sites and monitoring for visitor impacts as described in this alternative may trigger site mitigation efforts. Mitigation would require the development of an appropriate treatment plan in consultation with Nevada State Historic Preservation Office (SHPO).

Potential impacts to sites in the wilderness include direct and indirect damage from pedestrian traffic, vandalism, removal of artifacts, and unauthorized excavations. Site stewardship efforts and increased patrol by law enforcement officers and other BLM and NPS staff would help reduce impacts to cultural sites. Periodic monitoring of visitor use called for in this alternative would trigger mitigation efforts if impacts to cultural resources are detected. There would be no impairment to cultural resources under this alternative.

Alternative 3

Designation of trails, including interpretation of the indicated cultural site, would be mitigated as specified in an approved treatment plan in consultation with Nevada SHPO. Any construction activities, improvements, or the removal of existing obsolete developments that support implementation of this management plan would be evaluated for cultural resources prior to the initiation of the undertaking. This would include cultural resource inventories of the APE specific to each undertaking as well as the possibility of mitigating sensitive or threatened sites. Specifically, the designation of the Arch Trail, which passes by sensitive cultural sites, would require mitigation.

Potential impacts to sites in the wilderness include direct and indirect damage from pedestrian traffic, vandalism, removal of artifacts, and unauthorized excavations. Site stewardship efforts and increased patrol by law enforcement rangers and other BLM and NPS staff would help reduce impacts to cultural sites. The Proposed Action calls for periodic monitoring of visitor use and mitigation efforts if impacts to cultural resources are detected. There would be no impairment to cultural resources under this alternative.

No Action

Potential impacts to sites in the Muddy Mountains Wilderness include direct and indirect damage from pedestrian traffic, vandalism, removal of artifacts, and unauthorized excavations. Site stewardship efforts and patrol by law enforcement officers and other BLM and NPS staff help reduce impacts to cultural sites. However, the No Action Alternative does not establish a standard monitoring program or procedures to trigger mitigation efforts in response to impacts to cultural resources. The trail in Hidden Valley passes by sensitive cultural sites which may require mitigation in the future. Any such mitigation efforts would have to be initiated on a case by case basis. There would be no impairment to cultural resources under this alternative.

Noxious Weeds

Proposed action

The proposed action for noxious weed management in the Muddy Mountains Wilderness provides specific guidance for early detection and active noxious weed management. The proposed action provides a proactive approach to weed management including noxious weed monitoring at a set frequency, specific treatment methodology, and treatment intensity according to a minimum tool approach.

Alternative 2

Same as proposed action.

Alternative 3

Same as proposed action.

No action

Noxious weed control for the Muddy Mountains Wilderness area would rely on the Las Vegas Field Office Noxious Weed Plan and Lake Mead Noxious Weed Plan. Any weed control actions would require separate and detailed NEPA analysis for weed treatments. Weed survey would not be specified at a set frequency. Weed treatment and control would be delayed until NEPA analysis has been completed, and rapid response for the control of single or small groups of weed plants would not be covered by the no action alternative. Weed treatment would consist of treatment actions determined as a part of the annual scope of the noxious weed control program.

Threatened or Endangered Species and Sensitive Species

Proposed action

These include species that are federally listed, proposed or candidate species protected under the Endangered Species Act (ESA), species that are listed by the State of Nevada under the Nevada Revised Statutes (NRS), and species identified by the BLM as sensitive. Impacts to biological resources would be considered significant if the viability of a federally protected species is jeopardized or the action would result in the need to list a species under the ESA or the NRS.

Rock climbing may disrupt birds occupying areas on the cliffs or rocks, but nesting areas would be closed to climbing during the nesting season, so impacts would be limited to short-term flight responses. There would be no effect on foraging habitat.

No new trails are proposed for construction within bighorn winter and spring sheep range under this alternative. Maintenance of existing trails could result in temporary disruption of their use of the area during the period of repair. It is anticipated that repairs will take only a few days at most in any location, and will, therefore, not result in a long term disturbance to bighorn behavior.

The proposed management would assure availability of water for desert bighorn sheep herds and other sensitive wildlife species utilizing the wilderness.

Ground disturbing activities identified in the plan include: trail construction, maintenance, and restoration; construction of trailheads and vehicle access point turnarounds; removal of human made structures and effects; rehabilitation actions; and fire suppression and rehabilitation actions. Surveys will be conducted prior to implementation, and measures will be taken to avoid harassment, loss or injury to listed and sensitive wildlife during ground disturbing activities.

This alternative would result in approximately 6.3 acres of temporary and long term disturbance to desert tortoise and sensitive wildlife habitat. This includes approximately 2.7 acres of existing disturbance that would be restored to natural condition, 3.4 acres of existing disturbance that would permanently remain unavailable as habitat, and 0.2 acres of new habitat disturbance. The final result would be the permanent loss of approximately 3.6 acres of tortoise and sensitive wildlife habitat. If, in the future, informal trails are created by visitation, management guidelines provide for rehabilitation or modification if determined to have a negative impact on wildlife.

Camping and hiking will disrupt wildlife activities in the immediate area while people are present. The distance the animals will withdraw is dependant on the species and their acclimatization to the presence of humans. No long term effects to listed and sensitive wildlife are anticipated as Leave No Trace techniques will be encouraged, group size will be kept small so campsites will be small, and previously used campsites within ¼ mile of each other will be removed when encountered by rangers. Use of washes for picketing and high lining horses and other pack stock will reduce habitat disturbance that would occur if they were kept overnight in upland areas.

Of the four concrete dams, one earthen dam, and three guzzlers located within the wilderness, three do not hold water. Two guzzlers are operational and provide reliable water year long. Three dams hold water at times when natural catchments also hold water, but not during dry times when water is scarce in the area. Consequently, the dams provide little or no benefit to wildlife. Removal of all but the two guzzlers would occur if they are not historically significant or otherwise determined to be the minimum necessary for the administration of the area as wilderness. This would have no effect on T&E or sensitive species.

Legal collection of natural resources will not directly affect listed or sensitive species as collection of desert tortoises, Gila monsters and burrowing owls is not authorized under law. However, there may be a small loss of components of their habitat, such as rocks and plants. Common wildlife species have large species ranges or populations. Collection of some individuals is not likely to appreciably diminish the overall population size.

Effects of research and monitoring projects will be analyzed independently. Overall, the BLM and NPS will only authorize projects that cannot be conducted elsewhere or would improve management of the wilderness. Collection of federally and state listed species would require a federal and/or state collection permit. This will improve knowledge of local species populations and management techniques that overall will have a beneficial affect on the species.

This alternative is not likely to adversely affect the federally threatened desert tortoise. Impacts to sensitive species would be minor and would not result in impairment.

Alternative 2

Effects to listed and sensitive species would be similar to those described in Alternative 1 (Proposed Action). The effect differs under this alternative with regards to trail designations, trailhead construction and removal of wildlife water developments. There would be no designation of trails, therefore, this alternative would result in 2.7 acres less permanent disturbance to desert tortoise and sensitive species habitat. Except for the trail in Hidden Valley and those which are located in washes, all existing trails would be rehabilitated. Disturbance associated with rehabilitation would be temporary and would result in improvement of up to 3.7 acres of wildlife habitat.

No trailheads would be constructed under this alternative; instead vehicle turn-arounds would be installed. This would include a total disturbance area from turn-arounds of 0.5 acres, but this would be 0.4 acres less disturbance than the Proposed Action since turn-a-rounds are smaller in size than trailheads.

Of the five dams, two do not hold water. Three dams hold water at times when natural catchments also hold water, but not during dry times when water is scarce in the area. Consequently, the dams provide little or no benefit to wildlife. Removal of the dams would occur if they are not historically significant or otherwise determined to be the minimum necessary for the administration of the area as wilderness. This would have no effect on T&E or sensitive species.

Under this alternative, the BLM will consult with NDOW regarding removal of three wildlife guzzlers to restore habitat back to winter habitat instead of year round use. No natural year round water sources have been documented in the Muddy Mountains. Removal of the two functioning guzzlers will stress and likely decrease local population of desert bighorn sheep that have come to rely on the water in these locations. This species is increasingly isolated from adjacent ranges and water sources by paved roads (i.e., Northshore Road), growing rural communities (i.e., Overton, Logandale, Moapa), and increasing human activities along road corridors and may no longer be sustainable if year round water is not made available. Removal of the third non-functioning guzzler would have no effect.

This alternative is not likely to adversely affect the federally threatened desert tortoise. Impacts to sensitive species would be moderate but would not result in impairment

Alternative 3

Effects to listed and sensitive species would be similar to those described in Alternative 1 (Proposed Action). The effect to wildlife differs under this alternative with regards to trail and trailhead construction, shooting, and equestrian and stock use.

Under this alternative, an additional trailhead would be constructed on the east side of Hidden Valley and additional trails would be designated. This would result in an additional 3.5 acres of permanent disturbance to desert tortoise and sensitive species habitat than the proposed action.

Since more of routes would be designated as trail under this alternative, 0.8 acres less of rehabilitation would occur under this alternative than the Proposed Action.

Closing the Bowl of Fire area to hunting will result in less harassment of desert bighorn sheep during hunting season in this portion of the wilderness. It is expected that if hunting is restricted at the Bowl of Fire, that the number of hunting tags issued for the hunt unit would not decrease, but the activities would all occur on the BLM portion of the wilderness and adjacent areas.

Three of five dams within the wilderness periodically hold water during wet periods and may be used by wildlife, though natural waters are also present during wet periods. One guzzler would remain inoperable. Two guzzlers constructed for desert big horn sheep would continue to benefit the population size of that species. The Muddy Mountains do not contain documented year long water sources, and the guzzlers allow for year long use as compared to natural waters only available during winter.

Allowing equestrian use off trail throughout the wilderness may increase the potential for desert tortoises, Gila monsters and burrowing owls to be injured or killed if burrows are collapsed by horses stepping on them. Both species have limited ability to escape a caved in burrow. In addition, the animals may be crushed by the hooves as they shelter in the burrows.

This alternative may adversely affect the federally threatened desert tortoise. Impacts to sensitive species would be moderate but would not result in impairment

No Action

Under this alternative, existing habitat disturbances such as closed vehicle trails, foot-worn paths, trailheads and vehicle access points, totaling 5.6 acres of desert tortoise and sensitive species habitat would be left unaddressed. Existing roads and trails may restore over time if they are not used. Informal trailheads and vehicle access points may increase in size as they do not have defined boundaries.

Hunting with firearms will still be allowed in the wilderness and casual recreational shooting allowed in BLM managed portions. This activity may result in increased trash if targets are not cleaned up. This debris can become shelter for desert tortoises. When the debris is removed, desert tortoise may have to be moved out of harm's way, which is considered harassment.

Camping and hiking will disrupt wildlife activities in the immediate area while people are present. The distance the animals will withdraw is dependant on the species and their acclimatization to the presence of humans. Camping sites may be created in the portion of the wilderness open to this activity and informal trails may develop. Stock users may picket or highline their stock in vegetated areas, creating bare areas. This will result in an unknown amount of habitat loss to desert tortoises, Gila monsters and burrowing owls. It is anticipated that this will be commensurate with the amount of visitation and the intensity of use at each location.

Stock animals that can transmit catastrophic diseases to wildlife may be used within the wilderness as there will be no restrictions to use. This may result in the loss of the Muddy

Mountain bighorn sheep herd and introduction of the disease(s) to the Pinto Mountain Wilderness, North Muddy Mountains and other areas within the Colorado River corridor occupied by desert bighorn sheep. A significant loss of animals could result in a local and regional die off of the species.

Rock climbing may disrupt birds nesting on the cliffs or rocks, particularly sensitive Swainson's and ferruginous hawks. Adults may temporarily leave the nest if people are close by. If rock climbers use a rock outcrop or cliff face for more than a couple hours at a time or regularly throughout the nesting season, the adult may not return to the nest to successfully incubate eggs or feed young. Eggs may not be viable and hatchlings may die as a result. Foraging habitat would not be affected.

Three of five dams within the wilderness periodically hold water during wet periods and may be used by wildlife, though natural waters are also present during wet periods. One guzzler would remain inoperable. Two guzzlers constructed for desert big horn sheep would continue to benefit the population size of that species. The Muddy Mountains do not contain documented year long water sources, and the guzzlers allow for year long use as compared to natural waters only available during winter. This desert big horn population is increasingly isolated from adjacent ranges and water sources by paved roads (i.e., Northshore Road), growing rural communities (i.e., Overton, Logandale, Moapa), and increasing human activities along road corridors and may no longer be sustainable if year round water is not made available.

Legal collection of natural resources will not affect listed or sensitive species as collection of desert tortoises, Gila monsters and burrowing owls are not authorized under law. However, there may be a small loss of individual components of their habitat, such as rocks and plants. Common wildlife species have large species ranges or populations. Collection of some individuals is not likely to appreciably diminish the overall population size.

Effects of research and monitoring projects will be analyzed independently. Overall, the BLM and NPS will only authorize projects that cannot be conducted elsewhere or would improve management of the wilderness. Collection of federally and state listed species would require a federal and/or state collection permit. This will improve knowledge of local species populations and management techniques that overall will have a beneficial affect on the species.

This alternative is not likely to adversely affect the federally threatened desert tortoise. Impacts to sensitive species would be moderate but would not result in impairment.

Wilderness

Proposed Action

Untrammeled. Under this alternative, trammeling activities (those activities have the effect of controlling or manipulating the ecosystem) would continue in the Muddy Mountains Wilderness to the same extent as under the No Action Alternative. These trammeling activities include control of fire, rehabilitation of plant communities (under certain circumstances) after a fire, control of non-native invasive plants, and providing water to big horn sheep populations.

Although trammeling, these activities are expected to enhance the natural character of the wilderness.

Naturalness and primeval character. The natural and primeval character of the wilderness would be maintained or enhanced under the proposed action, and would be improved as compared to the no action. The Proposed Action would provide definite direction for the control of noxious weeds, and would direct fire management actions (including rehabilitation) to reduce the potential for conversion and dominance of introduced annual grasses. Designation of trails would be expected to better direct visitors in ways that would prevent degradation of natural resources. Trail designations, and limitations on horseback use will also help to limit impacts to plants and soils, and especially cryptogamic soil crusts, which, in the arid setting, are highly susceptible to damage.

Undeveloped. Under this alternative, the wilderness would have 7.4 miles of trail designated within it. This trail is the minimum necessary to provide for recreational opportunities while protecting natural resources by directing the majority of visitors away from sensitive locations and preventing more widespread impacts. Removal of several developments, including a fence, four concrete dams, one abandoned guzzler, and several miles of closed road would improve the undeveloped qualities of the wilderness, although there is a potential that three of the dams could be left in place after additional analysis. The removal of two road segments (edge of Color Rock Quarry and edge of Hidden Valley totaling approximately ¼ mile) would require, as the minimum tool, use of motorized earth-moving equipment due to cut and fill slopes and highly impacted soil. No change to the undeveloped qualities of the wilderness would occur by leaving two guzzlers which existed at the time of the wilderness designation.

Outstanding opportunities for solitude or a primitive and unconfined form of recreation. Outstanding opportunities for solitude would be largely unaffected by the proposed action. By designating the proposed trails, visitation could increase in those areas, causing the ability to find solitude to diminish. However, the locations of the designated trails are known areas of scenic and recreational opportunities and over time use increases would be expected in those areas without trail designations. Solitude will remain impaired by helicopter overflights unless opportunities to reduce overflights through work with the FAA occur. Opportunities for primitive and unconfined recreation will remain outstanding throughout the wilderness. Trails will enhance the ability of some to enjoy primitive recreational opportunities. The proposed action would cause limited confinement to recreational opportunities in order to enhance or preserve natural qualities. These actions include restricting horses to designated trails or washes, campfire restrictions, and restrictions on climbing. The plan allows for further restrictions on recreation (for example camping permits) if monitoring indicates new damage to natural resources is occurring.

Under this alternative, there would be short-term minor impacts to wilderness areas and long-term beneficial effects to wilderness character. This alternative would not result in impairment.

Alternative 2

Untrammeled. Impacts to this wilderness characteristic would be the same under this alternative as under the proposed action, except this alternative would reconsider the two wildlife guzzlers present, which may lead to returning, if ecologically possible, the wilderness to cool season big horn sheep use.

Naturalness and primeval character. This alternative would be the same as the proposed action except that no trails would be designated which could, over time, lead to additional and more disbursed impacts to natural resources. Under this alternative collection of natural resources would not be allowed and could be of benefit to preserving natural qualities. However, collection activity is not known to be a problem in this wilderness area at the present time.

Undeveloped. Under this alternative there would be no designated trail. However, the visitor created trails that are proposed for designation in the Proposed Action would continue to be used under this alternative. Removal of existing developments would be the same as under the proposed action with the addition of potential removal of two guzzlers.

Outstanding opportunities for solitude or a primitive and unconfined form of recreation. Outstanding opportunities for solitude would be the same as the proposed action. Even with the lack of designated trails, the solitude would be expected to be similar since the areas proposed for designated trails currently receive regular visitation. Other opportunities for primitive and unconfined recreation will be similar to the proposed action.

Under this alternative, there would be short-term minor impacts to wilderness areas and long-term beneficial effects to wilderness character. This alternative would not result in impairment.

Alternative 3

Untrammeled. Impacts to this wilderness characteristic would be the same under this alternative as the proposed action.

Naturalness and primeval character. This alternative would be the same as the proposed action except that more trails would be designated. The additional trails are not expected to be necessary to better direct visitors in ways that would prevent degradation of natural resources. In this arid ecosystem, allowing all cross country horseback riding would, over time, be expected to cause additional trails to develop with additional impacts to the natural resources.

Undeveloped. This alternative would be the same as the proposed action except that additional trails would be designated. Allowing all cross country horseback riding would be expected to lead to additional visitor created trails to become established. No dams or guzzlers would be removed under this alternative.

Outstanding opportunities for solitude or a primitive and unconfined form of recreation. Outstanding opportunities for solitude would be the same as the proposed action. Even with the addition of trails, the solitude would be expected to be similar since the areas proposed for trails currently receive regular visitation. Opportunities for primitive and unconfined recreation would be similar to the proposed action except that additional opportunities for trail hiking would be present.

Under this alternative, there would be minor impacts to wilderness areas. This alternative would not result in impairment.

No Action

Untrammeled. Under this alternative, several trammeling actions would continue in the Muddy Mountains Wilderness. These trammeling actions include control of fire, rehabilitation of plant communities after a fire, control of non-native invasive plants, and providing water to big horn sheep populations.

Naturalness and primeval character. There would be no definite direction for the control of noxious weeds under this alternative. Positive direction of fire management actions (including rehabilitation) to reduce the potential for dominance of annual grasses would also be lacking. Although many visitor created trails currently exist in the wilderness, they are not clearly identified, and as a result, visitors may more easily stray from them and cause impacts to new areas. This would especially be true for cross country horseback riding. Arid ecosystem plants and soils, especially cryptogamic soil crusts, are highly susceptible to damage. No plan for monitoring visitor use would be present to detect degradation caused by visitor use and limit that use if detected.

Undeveloped. Under this alternative there would be no designated trails. However, the visitor created trails that are proposed for designation in the Proposed Action would continue to be used under this alternative. Although many visitor created trails currently exist in the wilderness, not all of them are useful in controlling impacts. Allowing all cross country horseback riding would be expected to lead to additional visitor created trails becoming established. This alternative would not enhance this wilderness character as 5 dams, two guzzlers, and once fence would remain.

Outstanding opportunities for solitude or a primitive and unconfined form of recreation. Outstanding opportunities for solitude would be largely unaffected. No possibility to reduce the impairment of solitude by helicopter overflights would occur if BLM and NPS do not make efforts to coordinate with FAA on flight management. Opportunities for primitive and unconfined recreation would remain outstanding throughout the wilderness. Opportunities to hike trails would be limited as they would not be clearly identified on the ground or in agency produced materials. Except for seasonal campfire restrictions, no additional regulations of visitor use will impact the experience at the wilderness.

Under this alternative, there would be minor to moderate impacts to wilderness. This alternative would not result in impairment.

Vegetation

Proposed action

Effects to vegetation would be minor under the proposed action. Except for 0.2 acre, the proposed activities, including horse trails, would be within existing disturbed areas. 2.7 acres of existing disturbance would be rehabilitated. No trails are proposed within the Bowl of Fire, although allowances are made for a new trail designation there in the future, with a subsequent EA, if monitoring reveals impacts to vegetation and cryptogamic soil crusts. The proposal would also establish a monitoring system to detect impacts from hiking and camping throughout the wilderness, and establishes responses to minimize impact to vegetation. Where visitor use may be of sufficient quantity to cause the creation of foot warn paths, the proposed action would provide for monitoring and management response to protect vegetative resources. These measures will also serve to preserve a population of Las Vegas buckwheat where visitor use is presently occurring. Impacts to vegetation would be minor and would not constitute impairment.

Alternative 2

Affects to vegetation would be similar to those under the proposed action. Although there would be no designated trails, use would be expected to continue in the locations the trails are proposed in Alternative 1. It is possible that visitors would easily get off existing trails, as there would be no markings, and this could cause new impacts from visitor use. This alternative would have the greatest amount of rehabilitation of old roads or trails. Impacts to vegetation would be minor and would not constitute impairment.

Alternative 3

Under this alternative effects to vegetation would be similar to the proposed action, except more trail designations and less rehabilitation would occur. With fewer miles of trail being rehabbed and more trails being created the overall net loss of vegetation in the wilderness would be highest (see description of acres in the Wildlife section). Impacts to vegetation would be minor and would not constitute impairment.

No action

Under the No Action Alternative there would be no reclamation of trails within the wilderness area. There would be no monitoring or control of visitor use which could result in additional losses of vegetation, and potentially cause negative impacts to an important population of Las Vegas buckwheat. Impacts to vegetation could be moderate but would not constitute impairment.

Fire

Proposed Action

This alternative would result in minimal acres burned given the prompt response to wildland fires by aerial fire suppression resources. This alternative would result in improved fire suppression success as compared to the No Action Alternative, and the least amount of potential conversion to non-native annual grasses. By holding back a fire induced progression of non-native annual grasses, the ecosystem would remain at a low fire return interval which is naturally characteristic to the native ecosystem. This alternative provides direction to utilize Minimum Impact Suppression Tactics which will prevent unnecessary damage to the environment from fire suppression activities. The use of MIST tactics should help to preserve the wilderness characteristics and naturalness of the Muddy Mountains Wilderness.

Alternative 2

As compared to the Proposed Action, this alternative would result in more acres burned due to constraints on the use of fire retardant. Without aerial resources, suppression response time would be increased since long distance to and remoteness of the Muddy Mountains would cause significant delays for ground based resources (for example, fire engines). This would result in larger areas of non-native annual grasses and an increase of the fire return interval. Over time, the acres burned on an annual basis would become increasingly larger.

Alternative 3

Same as Proposed Action.

No Action

This Alternative would be less likely to achieve fire control objectives resulting in an increase in acres burned due to the requirement for prior approval for use of aerial resources including Helicopters, Single Engine Air Tankers and Large Air Tankers. This would result in larger areas of non-native annual grasses and an increase in the fire return interval from the naturally low fire return interval characteristic of the desert ecosystem. Overtime the acres burned on an annual basis become increasingly larger.

Wildlife

Proposed Action

This alternative would result in approximately 6.3 acres of temporary and long term disturbance to desert tortoise and sensitive wildlife habitat. This includes approximately 2.7 acres of existing disturbance that would be restored to natural condition, 3.4 acres of existing disturbance that would permanently remain unavailable as habitat, and 0.2 acres of new habitat disturbance. The final result would be the permanent loss of approximately 3.6 acres of tortoise and sensitive wildlife habitat. If, in the future, informal trails are created by visitation, management guidelines provide for rehabilitation or modification if determined to have a negative impact on wildlife.

Rock climbing may disrupt birds occupying areas on the cliffs or rocks, but nesting areas would be closed to climbing during the nesting season, so impacts would be limited to short-term flight responses. There would be no effect on foraging habitat.

Ground disturbing activities may affect wildlife species through loss of habitat features such as cover and forage and mortality or displacement of individuals during construction. Highly mobile species such as birds, jackrabbits, and coyote are less likely to be lost. In contrast, less mobile species such as reptiles and small mammals are more likely to be injured or killed during construction activities.

Of the four concrete dams, one earthen dam, and three guzzlers located within the wilderness, three do not hold water. Two guzzlers are operational and provide reliable water year long. Three dams hold water at times when natural catchments also hold water, but not during dry times when water is scarce in the area. Consequently, the dams provide little or no benefit to wildlife. Removal of all but the two guzzlers would occur if they are not historically significant or otherwise determined to be the minimum necessary for the administration of the area as wilderness. This would have no effect on T&E or sensitive species.

Under this alternative, the impacts to wildlife would be minor and would not constitute impairment.

Alternative 2

Effects to common wildlife species would be similar to those described in Alternative 1 (Proposed Action). The affect to wildlife differs under this alternative with regards to trail designations, trailhead construction and removal of wildlife water developments. There would be no designation of trails, therefore, this alternative would result in 2.7 acres less permanent disturbance to desert tortoise and sensitive species habitat. Except for the trail in Hidden Valley and those which are located in washes, all existing trails would be rehabilitated. Disturbance associated with rehabilitation would be temporary and would result in improvement of up to 3.7 acres of wildlife habitat.

No trailheads would be constructed under this alternative; instead vehicle turn-a-rounds would be installed. This would include a total disturbance area from turn-a-rounds of 0.5 acres, but this would be 0.4 acres less disturbance than the Proposed Action since turn-a-rounds are smaller in size than trailheads.

Of the five dams, two do not hold water. Three dams hold water at times when natural catchments also hold water, but not during dry times when water is scarce in the area. Consequently, the dams provide little or no benefit to wildlife. Removal of the dams would occur if they are not historically significant or otherwise determined to be the minimum necessary for the administration of the area as wilderness. This would have no effect on T&E or sensitive species.

Under this alternative, the BLM will consult with NDOW regarding removal of three wildlife guzzlers to restore habitat back to winter habitat instead of year round use. No natural year round water sources have been documented in the Muddy Mountains. Removal of the two functioning guzzlers will stress and likely decrease local population of desert bighorn, mountain lions, foxes, coyotes, raptors and other far ranging species that rely on these water sources. species is increasingly isolated from adjacent ranges and water sources by paved roads (i.e., Northshore Road), growing rural communities (i.e., Overton, Logandale, Moapa), and increasing human activities along road corridors and may no longer be sustainable if year round water is not made available. Removal of the third non-functioning guzzler would have no effect.

Under this alternative, the impacts to wildlife would be moderate but would not constitute impairment.

Alternative 3

Effects to common wildlife species would be similar to those described in Alternative 1 (Proposed Action). The affect to wildlife differs under this alternative with regards to trailhead construction, shooting, and equestrian and stock use.

Under this alternative, an additional trailhead would be constructed on the east side of Hidden Valley and additional trails would be designated. This would result in an additional 3.5 acres of permanent disturbance to desert tortoise and sensitive species habitat than the proposed action. Since more of routes would be designated as trail under this alternative, 0.8 acres less of rehabilitation would occur under this alternative than the Proposed Action.

Closing the Bowl of Fire area to hunting will result in less harassment of game species such as quail during hunting season in this portion of the wilderness. It is expected that if hunting is restricted in Color Rock Quarry, that the number of hunting tags issued for the hunt unit would not decrease, but the activities would all occur on the BLM portion of the wilderness and adjacent areas.

Three of five dams within the wilderness periodically hold water during wet periods and may be used by wildlife, though natural waters are also present during wet periods. One guzzler would remain inoperable. Two guzzlers constructed for desert big horn sheep would continue to benefit the population size of that species. The Muddy Mountains do not contain documented year long water sources, and the guzzlers allow for year long use as compared to natural waters only available during winter.

Allowing equestrian use off trail throughout the wilderness may increase the potential for burrowing species to be injured or killed if burrows are collapsed by horses stepping on them. In addition, the animals may be crushed by the hooves as they shelter in the burrows.

Under this alternative, the impacts to wildlife would be moderate but would not constitute impairment.

No Action

Under this alternative, existing habitat disturbances such as closed vehicle trails, foot-worn paths, trailheads and vehicle access points, totaling 5.6 acres of desert tortoise and sensitive species habitat would be left unaddressed. Existing roads and trails may restore over time if they are not used. Informal trailheads and vehicle access points may increase in size as they do not have defined boundaries.

Hunting with firearms will still be allowed in the wilderness and casual recreational shooting allowed in BLM managed portions. This activity may result in increased trash if targets are not cleaned up. This debris can become shelter for common wildlife.

Camping and hiking will disrupt wildlife activities in the immediate area while people are present. The distance the animals will move away will be dependant on the species and their acclimatization to the presence of humans. Camping sites may be created in the portion of the wilderness open to this activity and foot-worn hiking paths may develop. Stock users may picket or highline their stock in vegetated areas, creating bare areas. This will result in a loss of an unknown amount of wildlife. It is anticipated that this will be commensurate with the amount of visitation and the intensity of use at each location.

Three of five dams within the wilderness periodically hold water during wet periods and may be used by wildlife, though natural waters are also present during wet periods. One guzzler would remain inoperable. Two guzzlers constructed for desert big horn sheep would continue to benefit the population size of that species. The Muddy Mountains do not contain documented year long water sources, and the guzzlers allow for year long use as compared to natural waters only available during winter. This desert big horn population is increasingly isolated from adjacent ranges and water sources by paved roads (i.e., Northshore Road), growing rural communities (i.e., Overton, Logandale, Moapa), and increasing human activities along road corridors and may no longer be sustainable if year round water is not made available. Other species whose populations size benefit from the guzzlers include mountain lions, foxes, coyotes, raptors and other far ranging species.

Rock climbing may disrupt birds nesting on the cliffs or rocks. Adults may temporarily leave the nest. If rock climbers use a rock outcrop or cliff face for more than a couple hours at a time or regularly throughout the nesting season, the adult may not return to the nest to successfully incubate eggs or feed young. Eggs may not be viable and hatchlings may die as a result. This alternative will not negatively affect foraging habitat.

Legal collection of natural resources will result in the loss of individual animals or components of their habitat, such as rocks and plants. Common wildlife species have large species ranges or populations. Collection of some individuals is not likely to appreciably diminish the overall population size.

Effects of research and monitoring projects will be analyzed independently. Overall, the BLM and NPS will only authorize projects that cannot be conducted elsewhere or would improve management of the wilderness. This will improve knowledge of local species populations and management techniques that overall will have a beneficial affect on the species.

Under this alternative, the impacts to wildlife would be moderate but would not constitute impairment.

Recreation

Proposed Action

The Proposed Action would provide for continued use of the wilderness for hiking, hunting, horseback riding, camping, rock scrambling, exploring, and nature study. The presence of designated trails in the areas of higher use and directional signing will enhance recreational opportunities within the wilderness, while also providing management direction that will help protect the resources to which visitors are coming to enjoy. Trailheads and information made available to the public (maps and descriptions of the wilderness resource) will also enhance recreational opportunities and provide a management tool for protecting the resources. Agency led hikes will continue to provide guidance in the proper use of wilderness and benefit those visitors who are less capable of visiting on their own. Monitoring for impacts coupled with the proposed management responses to impacts (when detected) from camping, hiking, and group size will allow use while providing the protection of resources. Acquiring private land (if the private land owner makes it available for purchase) would safeguard access to the Anniversary Narrows.

Because horseback use would be directed to the most durable surfaces and not allowed cross country, the proposed action would diminish horseback riding opportunities. Limiting guiding to only those activities necessary for realizing the recreational opportunities within the wilderness would forgo the potential to expand commercially guiding opportunities (See appendix X for additional discussion on commercial guiding). Collecting natural resources (for example, rock hounding) would be further limited around the Bowl of Fire (NPS lands are closed to this activity by statute). However, the BLM lands proposed for closure are a small addition to the existing closure and few visitors would be effected. By utilizing natural features for the boundary would, however, create greater certainty on the part of visitors as to where the closed and open areas area compared to the current situation. Prohibiting fixed anchors in the wilderness would limit the opportunity to establish sport climbs (a bolt-intensive form of climbing which is generally not practiced in wilderness), but would have minimal effect on traditional climbing. Climbing potential in the Muddy Mountains Wilderness is limited due to short cliffs, and no need for fixed anchors is expected to support of the limited potential for traditional climbing. However, those visitors who do climb would have to walk off the top of the climb, which could further limit climbing potential, and could lead to the creation of decent trails if use establishes in the wilderness.

Effects on recreational opportunities would be minor and may include both beneficial and adverse changes, depending on visitor preferences and expectations.

Alternative 2

This alternative would be the same as the proposed action except for the following. No trail designations under this alternative would mean visitors would have less certainty of the opportunities for recreation in the wilderness. Although several existing trails would remain in the wilderness under this alternative, they would not be clearly marked or described in interpretive information. This could benefit some visitors in that there may be less chance of encountering others in the wilderness. There would be no designated horseback riding trail which would be a further limitation than the Proposed Action. Under this alternative, the western portion of the wilderness would remain closed to camping. Group size would be immediately restricted to levels below what is commonly identified as necessary to protect resources and opportunities for solitude. Not offering agency led hikes would discourage some visitors and would forgo the opportunity to present those visitors with education of appropriate visitation practices in the wilderness. Closing the entire wilderness to the collection of natural resources would limit activities (for example rock hounding) that have not been identified as currently causing degradation. Hunting opportunities could be diminished with the removal of the two wildlife water developments. No efforts to secure public access to Anniversary Narrows could result in a loss of recreational opportunities. Under this alternative, greater restrictions on activities would constitute a moderate effect on recreational opportunities.

Alternative 3

This alternative would be the same as the proposed action except for the following. More trail opportunities would be available than the Proposed Action including a designated trail in the Bowl of Fire. More information, including directional signing on roads to trailheads, would help visitors find and enjoy the wilderness. However, the potential increase in visitation could also diminish the opportunity to avoid crowds and find solitude. Hunting opportunities would be eliminated in the Bowl of Fire. Horseback riding opportunities would be greater since off trail riding would be allowed. Sport climbing opportunities would be made available with the allowance of fixed anchors for rock climbing. Greater recreational opportunities for those people who desire to be guided would be enhanced by allowing commercially guided trips. Collection of natural resources would be allowed on all BLM lands. Signs marking the boundary would be utilized to demark the agency boundary so that collectors would be less likely to wander onto NPS lands where collection is prohibited. Effects on recreational opportunities would be minor and may include both beneficial and adverse changes, depending on visitor preferences and expectations.

No Action

A lack of a comprehensive plan would mean uncoordinated management of recreational use. Very limited recreational management is currently being conducted. The No Action alternative would not preclude future planning efforts, either in a coordinated or piecemeal manner. No trails would mean less certainty for visitors recreating in the wilderness. Although existing undesignated trails would be remain under this alternative, there would be limited or no information available for visitors. Camping would continue to be prohibited in the western portion of wilderness. A lack of a monitoring system for visitor impacts, and lack of a strategy to reduce those impacts, such as camp site impacts, hiking and horse riding impacts, and group size requirements, could lead to impacts that would detract from the setting which is currently attracting visitors. Commercial guiding would be restricted to only hunting guides. Collection of natural resources would remain prohibited on NPS lands and allowed on BLM lands. Uncertainty of the agency boundary could lead to collection violations. Under this alternative, there would be no impact on recreation relative to existing conditions.

Cumulative Impacts

The analysis of cumulative impacts described are common to all alternatives since only minor differences exist between the alternatives. The analysis considers the cumulative impact the proposal would have with past, present, and reasonably foreseeable future actions within the geographic area surrounding the Muddy Mountains. This geographic area contains approximately 230,000 acres and is roughly bounded by the Black Mountains on the south and east, the North Muddy Mountains on the north, and the Dry Lake Range on the west. Within this area approximately 2,000 acres of surface disturbance is present, and no new disturbance is proposed. The source of the disturbance is motorized roads and trails including two paved highways, an interstate freeway, and a BLM backcountry byway. Numerous other off-highway vehicle routes are present and as many as 3 race events occur each year on those trails in the California Wash and White Basin areas. A railroad spur line accessing a gypsum mine is located in the southwestern portion of the area. The gypsum mine is located adjacent to the analysis area and occupies nearly 5,000 acres. Other mining areas occur within the geographic area, but most have been abandoned or have not been developed. High voltage powerlines pass by the Muddy Mountains Wilderness to the west. Other recreational activities occurring within the area include hiking and horseback riding. The total amount of surface disturbance which would result from one of the alternatives addressed in this EA ranges from 1 to 7 acres. Neither the proposal or one of the alternatives would result in cumulatively significant impacts when considered in combinations with existing or potential activities within the geographic area.

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Appendix A

Impact Definitions

CULTURAL RESOURCES

Negligible impacts: No potentially eligible or listed properties are present; no direct or indirect impacts.
Minor impacts: Potentially eligible or listed properties are present; no direct impacts or impacts with only temporary effects are expected.
Moderate impacts: Potentially eligible or listed properties are present; indirect impacts or, in the case of structures, where activity is limited to rehabilitation conducted in a manner that preserves the historical and architectural value of the property.
Major impacts: Potentially eligible or listed properties present; direct impacts including physical destruction, damage, or alternation of all or part of a property. Isolation of a property from or alteration of the character of a property's setting when that character contributes to its eligibility, including removal from its historic location. Introduction of visual, audible, or atmospheric elements that are out of character with the property of alter its setting. Neglect of a property resulting in its deterioration or destruction (36 CFR 800.5).
Impairment: Loss, destruction, or degradation of a cultural property, resource, or value to the point that it negatively affects the park's purpose and visitor experience.

THREATENED AND ENDANGERED SPECIES

No effect: The appropriate conclusion when the action agency determines that its proposed action would not affect a listed species or designated critical habitat.
Is not likely to adversely affect: The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on the best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
Is likely to adversely affect: The appropriate finding if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial. In the effect the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made.
Is likely to jeopardize proposed species/adversely modify proposed critical habitat – (Impairment): The appropriate conclusion when the action agency or the U.S. Fish and Wildlife Service identify situations in which the proposed action is likely to jeopardize the continued existence of a proposed species or adversely modify the proposed critical habitat.

VEGETATION

Negligible impacts: Impacts have no measurable or perceptible changes in plant community size, integrity, or continuity.

Minor impacts: Impacts are measurable or perceptible and localized within a relatively small area. The overall viability of the plant community would not be affected and, if left alone, would recover.

Moderate impacts: Impacts would cause a change in the plant community (e.g. abundance, distribution, quantity, or quality); however, the impact would remain localized.

Major impacts: Impacts to the plant community would be substantial, highly noticeable, and permanent.

Impairment: For this analysis, impairment is considered a permanent change in a large portion of the overall acreage of the park, affecting the resource to the point that the park's purpose could not be fulfilled and the resource would be degraded precluding the enjoyment of future generations. The impact would contribute substantially to the deterioration of the park's native vegetation.

WILDLIFE

Negligible impacts: No species of concern is present; no impacts or impacts with only temporary effects are expected.

Minor impacts: Non-breeding animals of concern are present, but only in low numbers. Habitat is not critical for survival; other habitat is available nearby. Occasional flight responses by wildlife are expected, but without interference with feeding, reproduction, or other activities necessary for survival.

Moderate impacts: Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or winter; mortality or interference with activities necessary for survival expected on an occasional basis, but not expected to threaten the continued existence of the species in the park.

Major impacts: Breeding animals are present in relatively high numbers, and/or wildlife is present during particularly vulnerable life stages. Habitat targeted by actions has a history of use by wildlife during critical periods, but there is suitable habitat for use nearby. Few incidents of mortality could occur, but the continued survival of the species is not at risk.

Impairment: The impact would contribute substantially to the deterioration of natural resources to the extent that the park's wildlife and habitat would no longer function as a natural system. Wildlife and its habitat would be affected over the long-term to the point that the park's purpose (*Enabling Legislation*, *General Management Plan*, *Strategic Plan*) could not be fulfilled and the resource could not be experienced and enjoyed by future generations.

ALL OTHER RESOURCES

Criteria and Thresholds for Impact Analyses of all Other Issues

Negligible impacts: The impact is at the lower level of detection; there would be no measurable change.
Minor impacts: The impact is slight but detectable; there would be a small change.
Moderate impacts: The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
Major impacts: The impact is severe; there would be a highly noticeable, permanent measurable change.

Appendix B

Commercial Services Needs Assessment

Section 4 (c) of the Wilderness Act prohibits commercial enterprises within wilderness. However, Section 4 (d) (6) establishes a special provision allowing for commercial services to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of wilderness areas. This assessment establishes the extent to which guiding and outfitting may be necessary and appropriate within the Muddy Mountains Wilderness.

The Muddy Mountains wilderness is readily and easily accessible to many visitors, and so the need for commercial guiding and outfitting assistance is not high. The majority of destinations in the wilderness are within an easy day hike from a parking point and the terrain generally does not require special skills beyond the ability to navigate. However, because of scenic attractions in parts of this wilderness, visitors come from a broader segment of the population, some of them unfamiliar with the desert and lacking the confidence to visit on their own. Because of this, and also to further proper etiquette including Leave No Trace, Ranger led hikes have been offered by the NPS in this area for many years. No applications for commercial guiding or outfitting have been submitted to the BLM or NPS for the Muddy Mountains Wilderness, with the exception of hunting guides. However, hunting guides seek permits for Clark County as a whole, not specifically for the Muddy Mountains Wilderness.

In large wilderness areas, overnight horse pack trips can be of great assistance to visitors in realizing the recreational and wilderness opportunities of an area. Overnight horse packing, because it requires experience and specialized equipment, is often not available to some visitors without the aid of a guide. The limited trail system and small size of the Muddy Mountains Wilderness, however, is not conducive to overnight horse pack trips. Single day horseback riding may also assist visitors in realizing recreational and wilderness opportunities, though short day rides are frequently more focused on the experience of being on a horse than experiencing the wilderness. Permitting regular guided trips would likely cater to visitors who would not otherwise have come to the Muddy Mountains, and who’s trail ride experience could have been easily accommodated in another location.

Guided and outfitted horseback trips are not necessary to realize the wilderness purposes of the Muddy Mountains Wilderness. The potential for visitor conflict is high because of the limited trail system available. The potential increase of visitor use levels would also increase the likelihood of exceeding trail condition standards and visitor encounter standards. If a commercial enterprise were to seek the opportunity to provide guided horseback riding trips, these could be accommodated in areas nearby but outside of the wilderness. Opportunities currently exist on the nearby Moapa Indian Reservation as well as at the Red Rock Canyon National Conservation Area.

Day and overnight hiking requires skill in orienteering, travel over uneven terrain, or camping skill. The desert environment, especially in summer, demands a greater skill level than some other locations. However, opportunities to follow marked trails will be available in the Muddy Mountains, and the access to trails and other scenic locations are off roads passable by most vehicles. Ranger led hikes are offered by the NPS for those people who need additional assistance. In addition, BLM and NPS maps and brochures as well as privately produced guidebooks provide assistance to visitors.

Commercially guided hiking trips are not necessary to realize the wilderness purposes of the Muddy Mountains Wilderness. Marked trails, Ranger led hikes, maps and available guidebooks make this wilderness readily accessible to most hiking visitors.

A limited opportunity exists for guiding which has as a primary purpose of assistance to people with disabilities, although to date there is no known demand for such a service. Guided horseback rides or assistance in other modes of travel compatible with wilderness would be proper for making wilderness benefits of the area available to people with disabilities. If an application were to be made, it is not expected an application would be for regular scheduled trips that would conflict with other visitors.

Some educational organizations are known to have general interest in leading students into this and other wilderness areas for education about Leave No Trace, wild land values and ethics, or environmental education. Educational organizations have also been known to have an interest in leading physical education classes in some of the same areas. Education about Leave No Trace, wild land values and ethics, or environmental education creates a direct benefit to the wilderness and would not be expected to be frequent or regularly scheduled. The infrequency and irregularity of an occasional class trip (where Leave No Trace principles are incorporated into the permit) would provide little conflict with other users, and would be proper for realizing the wilderness benefits of the area.

Physical education or regularly scheduled class trips would not be proper for realizing the recreational or wilderness benefits of the wilderness. Physical education normally has other goals more prominent than a wilderness experience. Frequent, regularly scheduled class trips will often have educational goals that can be achieved in a natural setting outside of wilderness. Permitting physical education or regularly scheduled classroom trips would likely increase visitor encounter levels in excess of standards and cause trail condition to exceed standards.

Wilderness areas are frequently designated in rugged mountains associated with big game (in particular, bighorn sheep). Therefore, big game hunters have few opportunities to hunt in non-wilderness areas. Some individual hunters may not thoroughly understand animal behavior, seasonal movements of animals, feeding areas, nor possess pack animals, gear, or the skills needed to locate, take, and, once harvested, care for a big game carcass. Hunting guides are a proper option for realizing the recreational benefits of a wilderness dependent hunt. Big game hunt areas are geographically defined, and since the number of tags is limited, the number of guides that may operate in the area is also limited. Small game hunting opportunities are considerably more wide spread, and not limited by geographically restricted tags. Therefore, hunters in pursuit of small game may readily seek opportunities in non-wilderness areas. Small game hunting guides are not necessary for realizing recreational or other wilderness purposes of the Muddy Mountains Wilderness.

Appendix C

Fire Suppression Guidelines

- A qualified Resource Advisor will be notified and/or will respond to all fires occurring in or threatening the wilderness.
- Use of rubber tired motorized vehicles will only be used in wilderness if the fire is threatening human life or property or wilderness characteristics. The Field Manager or Park Superintendent must approve the use of motorized vehicles in all cases.
- Air resources (helicopters and Single Engine Air Tankers) will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of the wilderness, unless authorized by the Field Manager or Park Superintendent.
- Use of retardant must be approved by the Incident Commander.
- Landing of helicopters will be kept to a minimum and with the approval of the Resource Advisor.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Stumps will be cut flush to the ground level. Utilization of existing natural barriers, minimum scratch line, and cold trailing is encouraged, where feasible. Fire line construction will be rehabilitated back to the natural contour.
- A “Leave No Trace” policy will be used in the wilderness. All evidence of human activity must be removed to the maximum extent possible.
- Noxious weeds will be controlled through the following guidelines:
    - Engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles coming from off district will, upon check-in and prior to proceeding to the incident, will be washed down at a government or commercial facility if they were not cleaned at release from the previous assignment, or are coming from a known area infested with noxious weeds.

        - The wash down will concentrate on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts, and on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse disposed of in a waste receptacle.
    - All portable equipment used on an incident (including but not limited to pumps, hose, fittings, water storage items, tents, tarps, helicopter support equipment, fold-a-tanks and free-standing tanks) will be cleaned of plant debris prior to being used on the incident.
    - During initial briefings, wash downs will be mentioned and facilities made available for oncoming crews
    - Upon leaving an incident, all vehicles will follow the wash down procedures above. Vehicles will be cleared of wash down procedures during checkout and crew evaluations.

- Fire Suppression Constraints in Desert Tortoise Habitat:

    - Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
    - Use of motor vehicles will be restricted to the minimum necessary to suppress wildfires within desert tortoise habitat. Obliterate all tire tracks to reduce possibility of future use by the public.
    - Use of aerial retardant is authorized. The use of foam or fugitive retardant is preferable to iron oxide retardant.
    - Do not burn out unburned fingers or islands of vegetation, unless needed to protect human life or property.
    - Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat. The briefing will identify steps that can be taken by fire personnel to minimize take of tortoises or tortoise habitat (i.e., destruction, harm or harassment), particularly due to vehicular activity.

Appendix D
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(EA # NV-052-05-399).

FINDING OF NO SIGNIFICANT IMPACT/DECISION RECORD

for the

Muddy Mountains Wilderness Management Plan

Bureau of Land Management
Environmental Assessment # NV-050-2006-349

Decision:

It is my decision to implement the Muddy Mountains Wilderness Plan in the Muddy Mountains Wilderness. The Bureau of Land Management (BLM) and National Park Service (NPS) both have management responsibility for this Wilderness. The BLM cooperated with the NPS in the preparation of the Wilderness Management Plan and Environmental Assessment. This Decision is to implement those parts of the plan addressing BLM administered lands. The NPS will prepare a separate decision document to implement those parts of the plan addressing activities on lands under NPS administration. The proposed action is in conformance with the Las Vegas Resource Management Plan, approved October 5, 1998. I have determined that the proposed action with the mitigation measures described in the EA and within this decision record will not have any significant impacts on the environment and that an EIS is not required.

Finding of No Significant Impact:

I have reviewed Environmental Assessment (EA) NV-050-2006-349, dated April 23, 2007. After consideration of the environmental effects as described in the EA, I have determined that the proposed Wilderness Management Plan will not significantly affect the quality of the human environment and that an Environmental Impact Statement (EIS) is not required.

I have determined the proposed action is in conformance with the approved Las Vegas Resource Management Plan and is consistent with the plans and policies of neighboring local, county, state, tribal and federal agencies and governments. This finding and conclusion is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and the intensity of impacts described in the EA.

Context: The Muddy Mountains Wilderness is a part of the National Wilderness Preservation System. However, the nature of the activities described in the Wilderness Management Plan is of local rather than national context. The activities proposed are not expected to be of special interest to or have weighted impact on visitors from outside the southern Nevada area. The majority of visitors to these two wilderness areas are expected to be from the local area. Southern Nevada is home to one of the fastest growing metropolitan areas in the US. Population growth in metropolitan Las Vegas and the surrounding area is anticipated to continue at a fast pace into the future. The growth in population base is expected to lead to increased local interest in and visitation of the two Wilderness areas.

Intensity:

1) *Impacts that may be both beneficial and adverse.*
The environmental assessment has considered both beneficial and adverse impacts of the proposed management for the two Wilderness areas. Actions to protect one element of wilderness character may result in the diminishment of another element of wilderness character. For example, guzzlers in the wilderness that compensate for human activity that has caused loss of water within the local bighorn sheep population's indigenous range, also conflict with the goal of leaving the wilderness undeveloped. The proposed management carefully balances between activities that may have beneficial affects to one character and adverse affects to another. The long-term outcome of the proposed management maintains or improves the Wilderness resource overall. The proposal will result in improved management of wilderness character in the following ways: 1) management will make progress at reducing trammeling activities; 2) management will minimize the amount of development present; 3) management will protect natural conditions; and, 4) outstanding opportunities for solitude or a primitive and unconfined form of recreation will be plentiful.

2) *The degree to which the proposed action affects public health or safety.*
The proposed management provides some features that enhance public health and safety. For example, maintained and marked trails will be provided which will aid visitors in safe travel and reduce the chance of getting lost. Written information provided to visitors will include safety topics. However, visiting a wilderness includes a certain amount of risk and self-reliance, and that is an important component to a Wilderness experience. The proposal will make no attempt at eliminating the risk that is inherently present to a visitor in a Wilderness setting.

3) *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*
The Muddy Mountains Wilderness is Congressionally designated for protection as a unit of the National Wilderness Preservation System. The Management Plan will provide for the use and enjoyment of the area in a manner that will leave it unimpaired for future use and enjoyment as Wilderness and for the preservation of its wilderness character.

4) *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*
Although the designation of Wilderness is a controversial process, the management of a Wilderness area, once designated, has fewer issues of controversy. No significantly controversial management issues were identified for the Muddy Mountains Wilderness. Six comment letters were received from the public. Several minor changes were suggested, but overall support for the proposal was expressed. Many comments only required editorial clarification. For substantive comments, and where determined to be appropriate by BLM, the proposal was modified as described under the Mitigation Measures of this Decision Record.

5) *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*
There are no highly uncertain, unique, or unknown risks from the proposed action.

6) *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*
The proposed action does not establish a precedent for future actions. Designation of Wilderness is solely the prerogative of Congress with Presidential approval. Management of Wilderness is directed by the Wilderness Act, other relevant legislation, and BLM policy. The proposed management does not deviate from that direction. Many of the issues resolved by this plan will be revisited in Wilderness Management Plans prepared in the future for other wilderness areas. Though many similarities exist with other Wilderness areas, and many management actions proposed here may be similar in subsequent Wilderness Management Plans, future plans will not be guided by this plan. Future plans for other Wilderness areas will be based on the site specific issues relative to those areas.

7) *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.*
The proposed management of the Wilderness is unrelated to other actions that have been, are, or will be taking place in the area. The proposed action does not contribute significantly to the affect of any of the past, present, or reasonably foreseeable future actions within the geographic area.

8) *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant scientific, cultural, or historical resources.*
The proposed action will not cause the loss or destruction of any significant scientific, cultural or historic resources. Before implementation of the proposed management, BLM will conduct a Class III inventory to assure that no sites eligible for nomination to the National Register of Historic Places will be affected. If avoidance of cultural sites is not possible, the proposal would either 1) not be implemented, 2) a new design would be proposed in a separate EA, or 3) the sites would be mitigated after consultation with Nevada State Historic Preservation Office (SHPO) and the development and approval of a treatment plan.

9) *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA of 1973.*
The BLM has conducted informal Section 7 consultation with the US Fish and Wildlife Service for the proposed action to establish measures to minimize impacts to the desert tortoise. Minimization measures include pre-construction surveys and construction monitoring and avoidance of any desert tortoise observed. The complete mitigation measures specified in the consultation are incorporated into the proposed action through this Decision Record. Sites proposed for surface disturbances (trail and trailhead construction and road rehabilitation) were surveyed and found negative for desert tortoise. The net effect of the proposed management is anticipated to be beneficial to desert tortoise. Implementation measures proposed by BLM further minimize potential adverse effects to the desert tortoise. The proposed action would not result in, and the consultation does not authorize, any take of any listed species.

10) *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.*
The proposed action will not violate or threaten to violate any Federal, State, or local law or requirement imposed for protection of the environment. The proposed action is consistent with the Wilderness Act, the Clark County Conservation of Natural Resources Act, and the Federal Land Policy and Management Act.

Rationale for Decision: The decision to approve the proposed action does not result in any undue or unnecessary environmental degradation and is in conformance with the Las Vegas Resource Management Plan, approved in October 1998.

Mitigation Measures

The selected alternative is the proposed action identified as Alternative 1 in the draft Wilderness Management Plan. The EA includes mitigation measures to avoid and minimize impacts to the desert tortoise and to avoid or mitigate impacts to cultural resources. The decision also includes additional minor mitigating modifications to the proposed action in response to public comment as described below.

The proposal is modified to prohibit campfires except those utilizing firewood carried in from outside the wilderness and when using a fire pan or blanket. The scarcity of firewood could result in impairment of the wilderness character if even a limited number of visitors used local bushes or the few small trees in the wilderness for fuel wood in campfires.

The proposal is modified to exclude the use of earth moving equipment in the wilderness for fire suppression purposes. Use of this equipment for fire suppression would be impractical in the Muddy Mountains Wilderness due to steep terrain. Furthermore, there is a high likelihood that such equipment could not be brought on fast enough to aid in fire suppression in the wilderness.

The proposal is modified to exclude the use of ground based motor vehicles for weed control. The weed management strategy for the Muddy Mountains Wilderness is to incorporate monitoring to detect weed infestations and implement weed treatment before a problem large enough to require the use of ground based motor vehicles occurs.

Recommended by: Juan Palma 4/20/07
Juan Palma, Field Manager,
Las Vegas Field Office
Date

Approved by: Ron Wenker 4/20/07
Ron Wenker, State Director,
Nevada
Date

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT FOR MUDDY MOUNTAINS WILDERNESS MANAGEMENT PLAN

April 2007

Lake Mead National Recreation Area
Nevada/Arizona

INTRODUCTION

The Muddy Mountains Wilderness was designated on November 6, 2002. It contains 48,019 total acres, with 3,521 acres managed by the National Park Service (NPS). The rest of the wilderness is managed by the Bureau of Land Management (BLM). The NPS cooperated with the BLM in the preparation of an environmental assessment (EA) for the implementation of the Muddy Mountains Wilderness Management Plan. The EA analyzed the no-action alternative and three action alternatives. This decision document approves only NPS activities occurring on Lake Mead National Recreation Area lands. The BLM will prepare a separate decision document covering activities on lands under its jurisdiction.

PURPOSE AND NEED

Muddy Mountains Wilderness is part of the National Wilderness Preservation System and is located approximately 20 miles northeast of Las Vegas, Nevada. The wilderness area crosses agency boundaries, and BLM and NPS each have jurisdictional authority for separate portions of the wilderness unit. The purpose of the Muddy Mountains Wilderness Plan is to 1) identify the conditions and opportunities which will be managed for within the wilderness; 2) create specific guidance for managing the resources and activities existing in the wilderness; and 3) develop a strategy to preserve the area's wilderness characteristics.

Southern Nevada is home to one of the fastest growing metropolitan areas in the U.S., and population growth in Las Vegas and the surrounding area is anticipated to continue at a fast pace into the future. The growth in population base is expected to lead to increased local interest in and visitation of the Muddy Mountains Wilderness, necessitating the development of a coordinated management strategy for the area.

SELECTED ACTION

The selected action is Alternative 1, which was identified and analyzed as the preferred alternative in the EA. Minor modifications to the Alternative were made based on public input and are described in detail under "Public Review and Comments." The modified selected action prohibits the collection of firewood for campfires within the wilderness area (while still allowing the import of firewood, artificial logs, or briquettes); excludes the use of earth-moving equipment for fire suppression activities; and excludes the use of ground-based motor vehicles for weed control.

The management strategy is based on six primary wilderness management goals: 1) To provide for the long-term protection and preservation of the area's wilderness character under a principle of non-degradation; 2) To manage the wilderness for the use and enjoyment of visitors in a manner that will leave the areas unimpaired for future use and enjoyment as wilderness; 3) To manage the wilderness using the minimum tool, equipment, or structure necessary to successfully and safely accomplish objectives that are essential for the administration of the area as wilderness; 4) To manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character; 5) To manage the NPS and BLM portions of the wilderness through a single management plan to provide a maximum amount of management consistency in wilderness protection across administrative boundaries; and 6) To manage the NPS portion of the area in a manner that furthers the purposes of the NPS Organic Act of 1916 and enabling legislation for Lake Mead National Recreation Area.

Since the majority of the Muddy Mountains Wilderness is remote and difficult to access while a smaller portion is easily accessed and close to a rapidly growing metropolitan area, specific objectives and management actions necessary to achieve the desired goals have been developed around two distinct management zones. Zone One, which includes the entire NPS portion of the wilderness, consists of the more accessible, highly visited areas, while Zone Two consists of the larger, remote backcountry areas. While management objectives may differ between the two zones, the manner in which projects are implemented (including the types of methods permitted) will be the same in both zones. Proposed elements of the plan address trail management, recreation (including camping, rock climbing, recreational riding, hunting, and shooting), interpretation, wildlife management, rehabilitation of disturbances, research and monitoring, fire management, and non-native plant management.

ALTERNATIVES CONSIDERED

The EA evaluated four alternatives in detail for addressing the purpose and need for action: Alternative 1 (the preferred alternative and selected action described above), Alternative 2 (human activity least evident), Alternative 3 (human activity most evident), and Alternative 4 (no action).

Alternative 2- Human Activity Least Evident: This alternative differs from the selected action in that there would be no trails or trailheads, less interpretation, and greater restrictions on some forms of recreation and fire suppression activities.

Alternative 3- Human Activity Most Evident: This alternative differs from the selected action in that there would be additional trails and trailheads and fewer restrictions on recreation.

Alternative 4- No Action: There would be no comprehensive management strategy or management zones under this alternative.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote NEPA, as expressed in Section 101 of NEPA. This alternative will satisfy the following requirements:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable or unintended consequences;
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and,
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative 1 is the environmentally preferable alternative because overall it would best meet the requirements in Section 101 of NEPA. Alternative 1 would balance population and resource use by providing a framework with which to mitigate potential impacts to the wilderness by anticipating future recreation demands, identifying interpretive opportunities, and establishing resource protection standards. Implementation of the Muddy Mountains Wilderness Plan would attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable or unintended consequences. It would assume for all generations a safe, healthful, environment, and would permit high standards of living and a wide sharing of life's amenities.

Unlike Alternative 1, the no-action alternative would not balance population and resource use because there would be no strategy for accommodating the increased demands that a rapidly growing metropolitan area will place on the wilderness's resources. Unlike Alternative 1, the other action alternatives would not attain the widest range of beneficial uses of the environment without undesirable or unintended consequences. Alternative 2 (human activity least evident) would place greater limits on recreational opportunities, and Alternative 3 (human activity most evident) would allow for a greater degree of impact to the resources.

MEASURES TO MINIMIZE OR AVOID ENVIRONMENTAL HARM

Throughout the planning process, mitigation measures were identified and have been incorporated into the selected action (alternative 1- preferred alternative) to reduce impacts below a significant level. All mitigation measures which are incorporated in the selected alternative are summarized in the matrix on the following page.

MITIGATION TOPIC	MITIGATION MEASURES	RESPONSIBILITY
Natural Resources Threatened and Endangered Species (Desert Tortoise)	Prior to any surface disturbing activities associated with the implementation of the Muddy Mountains Wilderness Plan, the following conservation measures will be implemented: • The project area will be surveyed for tortoises within 24 hours of the start of ground disturbance. If a tortoise is present, it will be allowed to move out of harm's way of its own volition. • All project personnel will receive desert tortoise education, which will include information on the species' life history and legal status as well as all stipulations associated with project implementation • A litter control program will be strictly enforced. • No pets will be allowed in the project area. • Speed limits will be strictly enforced. • Sites where vegetation is disturbed will be rehabilitated as soon as possible to restore habitat.	NPS Resource Manager
Cultural Resources Archeological Resources	To maintain compliance with Section 106 of the National Historic Preservation Act, inventories will be conducted to identify and evaluate cultural resources prior to initiating any undertaking that supports implementation of the management plan. If avoidance is not possible, the proposal would either 1) not be implemented, 2) a new design would be proposed in a separate Environmental Assessment, or, 3) the sites would be mitigated after consultation with Nevada State Historic Preservation Office (SHPO) and the development and approval of a treatment plan.	NPS Archeologist
Aesthetics and Visitor Experience	Guidance consistent with Leave No Trace principles will be developed to educate visitors on the proper disposal of refuse, fuel residues, and other waste.	NPS Resource Manager and Interpretation Staff

Why the Selected Action Will Not Have a Significant Impact on the Human Environment

The NPS used the NEPA criteria to evaluate whether the selected action would have a significant impact on the environment.

NEPA Criteria	Selected Action
Impacts that may have both beneficial and adverse aspects and which on balance may be beneficial, but that may still have significant adverse impacts which require analysis in an EIS.	None of the impacts associated with this project reach a level of significance and do not require analysis in an EIS. The environmental assessment has considered both beneficial and adverse impacts of the proposed management for the Wilderness area. Actions to protect one element of wilderness character may result in the diminishment of another element of wilderness character. The proposed management carefully balances between activities that may have beneficial affects to one character and adverse affects to another. The long-term outcome of the proposed management maintains or improves the Wilderness resource overall. The proposal will result in improved management of wilderness character in the following ways: 1) management will make progress at reducing trammeling activities; 2) management will minimize the amount of development present; 3) management will protect natural conditions; and, 4) outstanding opportunities for solitude or a primitive and unconfined form of recreation will be plentiful.
The degree to which public health and safety are affected.	The proposed management provides some features that enhance public health and safety. For example, maintained and marked trails will be provided which will aid visitors in safe travel and reduce the chance of getting lost. Written information provided to visitors will include safety topics. However, visiting a wilderness includes a certain amount of risk and self-reliance, and that is an important component to a wilderness experience. The proposal will make no attempt at eliminating the risk that is inherently present to a visitor in a wilderness setting.
Any unique characteristics of the area.	The Muddy Mountains Wilderness is Congressionally designated for protection as a unit of the National Wilderness Preservation System. The Management Plan will provide for the use and enjoyment of the area in a manner that will leave it unimpaired for future use and enjoyment as Wilderness and for the preservation of its wilderness character.
The degree to which the impacts are likely to be highly controversial.	Although the designation of wilderness is a controversial process, the management of a wilderness area, once designated, has fewer issues of controversy. No significantly controversial management issues were identified for the Muddy Mountains Wilderness. Six comment letters were received from the public. Several minor changes were suggested, but overall support for the proposal was expressed. Many comments only required editorial clarification. For substantive comments, and where

	determined to be appropriate by NPS, the proposal was modified as described under the Public Involvement Section below.
The degree to which the potential impacts are highly uncertain or involve unique or unknown risks.	There were no highly uncertain, unique, or unknown risks identified during preparation of the environmental assessment, agency consultation, or the public review period.
Whether the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.	The action does not establish a precedent for future actions. Designation of wilderness is solely the prerogative of Congress with Presidential approval. Management of wilderness is directed by the Wilderness Act, other relevant legislation, and NPS policy. The proposed management does not deviate from that direction. Many of the issues resolved by this plan will be revisited in Wilderness Management Plans prepared in the future for other wilderness areas. Though many similarities exist with other wilderness areas, and many management actions proposed here may be similar in subsequent Wilderness Management Plans, future plans will not be guided by this plan. Future plans for other wilderness areas will be based on the site specific issues relative to those areas.
Whether the action is related to other actions that may have individual insignificant impacts but cumulatively significant effects.	The management of the wilderness is unrelated to other actions that have been, are, or will be taking place in the area. The action does not contribute significantly to the affect of any of the past, present, or reasonably foreseeable future actions within the geographic area.
The degree to which the action may adversely affect historic properties in or eligible for listing in the National Register of Historic Places, or other significant scientific, archeological, or cultural resources.	The action will not cause the loss or destruction of any significant scientific, cultural or historic resources. Before implementation of the proposed management, NPS will conduct a Class III inventory to assure that no sites eligible for nomination to the National Register of Historic Places will be affected. If avoidance of cultural sites is not possible, the proposal would either 1) not be implemented, 2) a new design would be proposed in a separate EA, or 3) the sites would be mitigated after consultation with Nevada State Historic Preservation Office (SHPO) and the development and approval of a treatment plan.
The degree to which the action may adversely affect an endangered or threatened species or its habitat.	The U.S. Fish and Wildlife Service concurred with the determination of NPS and BLM that implementation of the Wilderness Management Plan is not likely to adversely affect the desert tortoise or its habitat.
Whether the action threatens a violation of federal, state, or local law	The action will not violate or threaten to violate any Federal, State, or local law or requirement imposed for protection of the environment. The action is consistent with the Wilderness Act

or requirements imposed for the protection of the environment.	and the Clark County Conservation of Natural Resources Act.

PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

Scoping

A public notification was mailed in August, 2004 to 80 recipients to introduce the proposed project to the public and initiating scoping. A news release was sent to newspapers, television stations, and radio stations in Las Vegas, Henderson, Boulder City, Overton, and Logandale, Nevada. Government entities receiving notification of the project included the Natural Resource Conservation Service, Nevada Department of Wildlife, Nevada Department of Minerals, Clark County Comprehensive Planning Department, Moapa Tribal Business Council, and local government offices in our gateway communities. Other stakeholders, including concessionaires and the congressional delegations of Nevada, also received notification of this project. Fourteen comments were received following the scoping period which ended on October 4, 2004. Comments were related to existing use of the area, resources and values found in the area, trails and access, opportunities for interpretation, and types of regulation needed.

Consultation and Permitting Requirements

Biologists determined that the implementation of the Muddy Mountains Wilderness Plan is not likely to adversely affect the federally threatened desert tortoise and requested informal consultation with the U.S. Fish and Wildlife Service (USFWS) on January 19, 2007. On March 7, 2007 the USFWS concurred with this determination based on the following: 1) Survey results for the proposed surface disturbance associated with trailhead construction and road rehabilitation actions were negative for desert tortoise presence; 2) the net effect of management actions are anticipated to be beneficial to the desert tortoise; 3) the action area is a designated wilderness area which restricts most activities that may result in take of desert tortoises; and 4) proposed mitigation measures further minimize potential adverse effects to the desert tortoise below the threshold at which take may occur.

To maintain compliance with Section 106 of the National Historic Preservation Act, inventories will be conducted to identify and evaluate cultural resources prior to initiating any undertaking that supports implementation of the management plan. If avoidance is not possible, the proposal would either 1) not be implemented, 2) a new design would be proposed in a separate Environmental Assessment, or, 3) the sites would be mitigated after consultation with Nevada State Historic Preservation Office (SHPO) and the development and approval of a treatment plan.

Public Review and Comments

The Environmental Assessment was made available for public and agency review and comment during a 45-day review period beginning October 26, 2006 and ending December 11, 2006. The mailing list for the Muddy Mountains is comprised of 89 federal and state agencies, individuals, businesses, and organizations who have expressed interest in projects covering the area. Wilderness groups on the mailing list included Wilderness Watch, Friends of Nevada

Wilderness, the Wilderness Society, Nevada Wilderness Project, the Wilderness Land Trust, and the Sierra Club. All individuals on the mailing list were mailed notifications that the Environmental Assessment was available for review on the internet, and given the option to request a paper copy. Four requests for hard copies were received and filled; all other interested parties were content utilizing the website.

The announcement and document were published on the BLM's internet website. In addition, an announcement was sent to Congressional staff members, area newspapers, and radio and television stations. Individuals and organizations could request the Environmental Assessment in writing, by phone, or by e-mail. Seven comments were received during the 45-day review period, including one from the Nevada Department of Wildlife and one from the Nevada State Historic Preservation Office. All comments supported the preferred alternative, and included requests for clarifications and minor modifications of the proposal. These comments are discussed below.

The proposed action as described in the EA would discourage campfires and encourage those wishing to have them to carry in their firewood. During the comment period, comments were received regarding the scarcity of firewood and the damage that could occur if bushes or the few small trees in washes became the fuel source for even a limited number of campfires. The NPS agrees with this comment, and the selected action therefore prohibits campfires except those utilizing firewood carried in from outside the wilderness and when using a fire pan or blanket, which allow ashes to be carried out or disposed of in an appropriate location.

The proposed action as described in the EA would allow for the use of earth moving equipment where fires threaten to convert the ecosystem from native vegetation to introduced annual grasses. Comments were received regarding the impracticality to utilize earth moving equipment in the Muddy Mountain's steep terrain, and the likelihood that such equipment could not be brought on fast enough in response to wild fires in the wilderness. The NPS agrees with this comment, and the selected action therefore excludes the use of earth moving equipment in the wilderness for fire suppression purposes, which is consistent with the park's Fire Management Plan.

The proposed action as described in the EA would allow driving motorized vehicles in the wilderness for weed control under conditions where the weed infestation is of such size that control could not be achieved without it. Comments were received objecting to the potential for such use. The NPS commitment to weed control is to treat weeds promptly. The weed management strategy for the Muddy Mountains Wilderness is to incorporate monitoring to detect weed occurrences before they become a problem large enough to require the use of ground-based motor vehicles. Furthermore, it is unlikely that such vehicle would meet "minimum tool" requirements. The selected action therefore excludes the use of ground-based motor vehicles for weed control.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to reviewing the list of significance criteria, Lake Mead National Recreation Area determined that implementation of the selected action (alternative 1-preferred alternative) will not constitute an impairment of park resources or values or alter opportunities for the enjoyment of the park. This conclusion is based on a thorough analysis of the impacts described in the environmental assessment, agency and public comments received, and the professional judgment of the decision-maker in accordance with the *NPS Management Policies 2006*. As described in the environmental assessment, implementation of the selected action (preferred alternative) will not result in major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Lake Mead National Recreation Area; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents.

CONCLUSION AND BASIS FOR DETERMINATION

Based on the analysis completed in the environmental assessment, the capability of the mitigation measures to reduce, avoid, or eliminate impacts, and with due consideration of public response, the National Park Service determined that the selected alternative does not constitute an action that normally requires the preparation of an environmental impact statement.

Negative environmental impacts that could occur are negligible to minor in effect. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, known ethnographic resources, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects, or elements of precedence were identified. The implementation of the selected actions will not violate any federal, state, or local environmental protection law. There are no significant impacts to the affected environment.

There are no highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence identified. Implementation of the action would not violate any federal, state, or local environmental protection law. Therefore, in accordance with the National Environmental Policy Act of 1969, and regulations of the Council on Environmental Quality (40 CFR 1508.9), an environmental impact statement will not be prepared for this project, and the selected action may be implemented as soon as practicable.

Recommended: William K Dickinson 4/17/07
William K. Dickinson, Superintendent Date
Lake Mead National Recreation Area

Approved: Jonathan B. Jarvis 4/24/07
Jonathan B. Jarvis, Regional Director Date
Pacific West Region

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